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NATO Military Policy: Obtaining Conventional Comparability with the Warsaw Pact

Steven L. Canby

A Report prepared for
DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Rand
SANTA MONICA, CA. 90406

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PREFACE

This report reappraises U.S. military posture in Europe in order to uncover options that U.S. policy-makers may have neglected in the choice of alternative force structures and operating practices. Many U.S. and NATO policy discussions rest on the premise of NATO's conventional inferiority to Warsaw Pact forces. This study accepts that premise but questions its origin in an effort to escape some of the dilemmas that have for so long confronted U.S. and European decision-makers. What is needed is a change in the setting for analyzing issues pertinent to the impending conferences on European security and mutual and balanced force reduction (MBFR).

This study analyzes and compares the processes of *how* resource inputs get turned into military outputs, asks what *kinds* of outputs are desired, and states the *kind* of doctrine and organization that is indicated. The study argues that NATO can readily attain conventional comparability or parity without an increase in military budget or manpower.

This report is essentially an exercise in *net military assessment*. It elaborates the general case against present NATO practices and explores a variety of seemingly minor problems, which are, in some cases, not at all minor in consequence and always symptomatic of the dislocations afflicting the status quo. This assessment shows that many of NATO's deficiencies are a self-imposed assortment of inertia and misunderstanding. If these deficiencies can be corrected, an adequate and affordable conventional defense will be within reach. As a consequence many of NATO's intra-Alliance and East-West problems will prove much more tractable.

The attempt to synthesize the broad issues of force posture in this report has made it necessary to deal in large concepts and war-fighting philosophies. Earlier work focused on specific ways units could be structured to implement these concepts. Consequently, consideration here is given only to the large-scale issues of military strategy and force design in Europe.

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I. PROLOGUE

The conventional forces of NATO were created to "shield" Western Europe from a Soviet land attack; the "sword" has been American nuclear power. This well-known descriptive analogy reflects the basic military deficiency underlying many of NATO's military and political difficulties over the years. Because nuclear weapons were relatively cheap and the United States enjoyed a technological lead, NATO has emphasized its "sword" and neglected its "shield." In fact, however, the nuclear sword can only be employed as a weapon of last resort, leaving NATO very vulnerable to a less-than-nuclear attack. The Kennedy and particularly the Nixon administrations have attempted to strengthen the conventional capability of the Alliance so that a sufficient interval for reflection could separate the initiation of a conflict and NATO's predicted need to escalate to nuclear weapons. But a conventional shield strong enough to thwart or possibly defeat a full-scale Soviet land attack has never been seriously considered because of the presumed expense. Indeed, the importance of such a shield has never been fully appreciated, largely because it is commonly dismissed as infeasible.

If NATO *could* obtain conventional comparability with the Warsaw Pact countries at no more cost--and possibly considerably less cost--than is budgeted now, many of NATO's pressing military and political difficulties would disappear. The Mansfield Resolution calling for U.S. troop reductions in Europe, for example, reflects concern for the perennial U.S. balance-of-payments gap, inequitable burden sharing within the Alliance, and an imbalance between U.S. commitments overseas and our willingness to bear the costs. Yet if conventional parity with the Warsaw Pact could be obtained at current budgetary levels or less, as recommended in this report, U.S. troop levels (but not capabilities) could be reduced and these concerns would be greatly eased.

Conventional comparability between NATO and the Pact would obtain still more. A strong conventional force would not remove the requirement for tactical nuclear weapons, but conventional parity would affect the probability of their use by reducing Soviet incentives for attacking

Western Europe, raising the tactical nuclear threshold, and lessening the danger of inadvertent nuclear warfare either through a (NATO) hair-trigger nuclear response or Soviet preemptive first use. Conventional parity would also reduce NATO's tendency to overemphasize its nuclear sword; this is particularly important if the United States wishes to discourage the Europeans from maintaining expensive national nuclear forces.

Above all, conventional comparability could profoundly contribute to European political normalization and arms control arrangements. Many reasons have been advanced to explain why post-World War II tensions in Europe have endured for a quarter of a century. One underlying cause is surely the asymmetry in military power between East and West. This military asymmetry--making each side vulnerable to the unique power advantage of the other--has aroused mutual fear and feelings of insecurity that have led to misinterpreted intentions on both sides. The recent Soviet attainment of strategic parity with the United States has accentuated some European fears. However, if NATO could achieve a comparable conventional capability, the problems wrought by military asymmetry would disappear. A rough military balance in conventional, tactical nuclear, and strategic nuclear capabilities will have been achieved. Furthermore, the process of restructuring NATO's forces for military symmetry and conventional comparability would ameliorate most Western objections to mutual and balanced force reduction (MBFR) and invalidate many current recommendations concerning its implementation. Politically, since conventional comparability would eliminate the Soviets' ability to hold Western Europe hostage to their conventional forces (in the context of neutralized U.S. strategic power) and thus the political advantage gained from forward deployed ground forces, the Warsaw Pact would also be better motivated toward negotiated solutions and reciprocal force reductions. Equally important, with a military balance in effect, Soviet endorsements of political détente would gain credibility in NATO's eyes.

Obtaining conventional comparability vis-à-vis the Warsaw Pact would thus resolve many of NATO's political and military difficulties. The problem is implementation: How can NATO engineer conventional parity? This is the subject of the remainder of this report, wherein I attempt

to show *why* NATO lacks parity (while spending considerably more than the Warsaw Pact countries), and *how* NATO could obtain conventional parity within present budgetary limitations. In developing my argument, I first evaluate several hypotheses that have been advanced to explain the current conventional disparity between NATO and the Warsaw Pact. I will then show why and how the Soviets have developed a conventional force designed to fight a different war than the one NATO has contemplated. The final sections will indicate how NATO and the United States, in particular, could save substantial sums by

1. Adapting to Soviet strategic imperatives of a short war.
2. Adopting a defensive rather than an offensive military style.
3. Implementing a number of technological improvements and organizational economies.

II. HYPOTHESES EXPLAINING NATO'S MILITARY DEFICIENCIES

NATO's mobilizable resources compare with those of the Warsaw Pact (WP) as follows: NATO's population (including France) is 54 percent greater than the population of the WP nations; its GNP, 167 percent greater; and its military budget, 120 percent larger. (See Table 1.) Even after Vietnam (i.e., a 2.39 million U.S. military), NATO's total military manpower will be 24 percent larger than the WP's and its armies 13 percent larger. Yet the overwhelming opinion of Western military and political observers is that NATO is considerably weaker than the WP in conventional power. The only dissenters from this view have been the Pentagon's systems analysts during the McNamara period, as exemplified by Alain Enthoven (former Assistant Secretary of Defense for Systems Analysis).¹

HYPOTHESIS 1: THE ENTHOVEN HYPOTHESIS OF RELATIVE EQUALITY THAT NATO CAN BE MADE AS STRONG AS THE PACT WITH MINOR IMPROVEMENTS

Enthoven's two-part thesis is that (1) the WP threat has been exaggerated; and (2) since NATO is spending more and has larger forces, it must be at least as effective as the WP.

In reaching these conclusions, Enthoven first pointed out, correctly, that NATO has always been mesmerized by the large number of divisions maintained in the Soviet active force structure. Prior to 1960, there was some justification for this fear. In 1952 the Soviets maintained 175 divisions that were fleshed out for combat; but by 1960, the United States and NATO were still counting 175 divisions that would have dropped Soviet manning per division slice² from 27,000 to only 9000. Enthoven,

¹ See Alain C. Enthoven and K. Wayne Smith, "What Forces for NATO? And from Whom?", *Foreign Affairs*, Vol. 48, No. 1, October 1969; and *idem*, Chap. IV of *How Much Is Enough? Shaping the Defense Program, 1961-1969*, Harper & Row, New York, 1971. To simplify the discussion, coauthorship of these titles will not be reflected in the text.

² A division slice is the division plus its share of nondivisional support. The numerator is the force size (corps, field army, theater, and total army), and the denominator is the number of division or division equivalents. The present Soviet total army slice is about 1,750,000

Table 1
NATO AND WARSAW PACT COMPARISONS, 1970-1971

Country	Population in Millions	GNP in Billions (1970)	Military Budget in Billions (1971)	Military Budget as Percent of GNP	Armed Forces Strength in Thousands	Armed Forces as Percent of Population	Air Force Strength in Thousands	Navy Strength in Thousands	Army Strength in Thousands	Marine Strength in Thousands	Division Equivalents (Unadjusted) ^a
United States	208.1	977	78.7	8.1	2,699	1.3	757	623	1,107	212	182 ^b
West Germany	60	185	6.0	3.2	467	.8	104	36	327	--	11 ^c
(ex Berlin)											
Great Britain	56	121	6.1	5.1	381	.7	111	77	185	8	6 ^c
Benelux	23.3	57	1.8	3.1	214	.9	42	21	148	3	3 ^c
Canada	21.7	78	1.7	2.2	85	.4	37	15	33	--	1
Italy	54	93	2.7	2.8	414	.8	74	45	295	--	10 ^c
Greece and Turkey	45.1	23	.8	3.4	668	1.5	73	57	538	--	30 ^c
Norway and Denmark	8.9	28	.8	2.9	76	.9	19	15	42	--	2
Portugal	9.7	6	.4	6.5	218	2.2	21	15	179	3	4 ^c
Total NATO	486.8	1,569	98.9	6.3	5,221	1.1	1,238	903	2,854	226	88 ^c
France	51.2	148	5.2	3.5	502	1.0	104	69	329	--	9 ^c
Total NATO and France	538.0	1,717	104.1	6.1	5,723	1.1	1,342	971	3,183	226	98
USSR	245.7	490	39.7	8.1	3,375 ^d	1.4	550	460	2,000	15	161 ^c
East Germany	17.2	34	2.1	6.3	126	.7	20	16	90	--	6 ^c
Poland	33.2	43	2.2	5.2	265	.8	55	20	190	--	15 ^c
Czechoslovakia	14.7	30	1.8	5.8	185	1.3	40	--	145	--	12 ^c
Hungary	10.3	14	.5	3.6	103	1.0	13	--	90	--	7 ^c
Rumania	20.4	21	.8	3.7	160	.8	21	9	130	--	9 ^c
Bulgaria	8.6	9	.3	3.1	148	1.7	22	9	117	--	9 ^c
Total Pact	350.0	642	47.4	7.4	4,362	1.3	721	515	2,762	15	220 ^c (137 ^c) ^e

SOURCE: Institute for Strategic Studies, *The Military Balance 1971-1972*, London, 1971.

^aDivision equivalents equate 3 brigades and 11 maneuver battalions as one division. Divisions have not been adjusted for widely varying country organizations.

Divisional counts can be misleading from different mobilization and deployment practices. The European NATO count represents a peacetime structure that is designed to be continuously deployed and maintained in combat by replacements of personnel and equipment losses. The nominal WP count represents a maximum number of immediately mobilizable divisions that are designed to replace each other rather than for continuous and simultaneous deployment. Thus, the nominal count includes the WP's mobilizable divisions, but not NATO's. NATO units are generally (except for Greece) kept near full strength, whereas only one-third of the WP divisions are kept at comparable strength, another one-third are rapidly mobilizable to full strength, and one-third are cadre divisions.

^bThree marine divisions, 16 army divisions, and a number of nondivisional brigades and battalions (but excluding nondivisional air cavalry squadrons and troops).

^cNominal divisions.

^d350,000 are in the separate Strategic Rocket Forces.

^eSoviets have a nominal 161 divisions (including naval infantry) but approximately one-third are low-strength cadre divisions. The 59^c non-Soviet divisions are equivalent to about one-half a Soviet division because many are smaller than their Soviet counterparts and most are maintained at 30 to 70 percent strength. The 137^c figure is therefore an estimate of the WP's peacetime division strength.

therefore, considered unrefined numbers of divisions to be a biased indicator of relative conventional strength: Soviet (and Pact) divisions are smaller than NATO's; they have less nondivisional backup, and many are skeletonized cadre divisions analogous to uncounted U.S. reserve divisions. Because of these qualitative differences, Enthoven concluded that actual personnel strength and equipment on hand were a better indicator of relative strength than numbers or divisions. On this basis, Enthoven claimed (see Table 2) that although the WP had more divisions in the critical European center region, NATO wielded (or could readily wield) comparable conventional strength.

Although the WP's numerical advantage can thus be whittled down, the Red Army remains formidable because of its more rapid reinforcement capabilities. The Enthoven comparison (Table 2) excluded the large number of divisions the Soviets could rapidly redeploy from Western Russia.³ NATO lacks such reinforcements, except in the form of U.S. reserve divisions, which require a minimum of three months for deployment. This asymmetry in reinforcing capability enabled critics to dismiss Enthoven's overall assertion of comparable conventional strength in the center region.

Enthoven's second thesis (that NATO must already be as effective as the WP armies) was based on his analysis of comparative forces, as summarized in Tables 2 and 3. Taken at face value, these static comparisons indicate rough parity, if not Western superiority. Correspondingly, Enthoven concluded:

Thus, in most measures of size, the forces facing each other in central Europe are roughly equal. The Pact forces are structured differently, but this is more a question of force mix than of force size.⁴

The last sentence helps to explain Enthoven's approach and many

men/161 divisions, or 10,900. The U.S. total army slice (using division equivalents but similarly excluding strategic forces) is 71,000.

³ Enthoven dismissed the superior Soviet mobilization and reinforcement capabilities on the grounds that "the Soviets are often assumed to be able to do many things that we cannot." *How Much Is Enough?*, p. 152.

⁴ Italics added. *Ibid.*, pp. 149-150.

Table 2

M-DAY LAND FORCES IN THE EUROPEAN CENTER REGION^a IN MID-1968

Force	NATO	Percentage	Warsaw Pact
Divisions	28 ^b / ₃		46 ^c
Manpower in divisions	389,000		368,000
Manpower in division forces	677,000		619,000
Riflemen (NATO as percentage of the Pact)		100	
Equipment (NATO as percentage of the Pact):			
Tanks		55	
Antitank weapons		150	
Armored Personnel Carriers (APCs)		130	
Artillery and mortars (number of tubes)		100	
Divisional logistic lift		150	
Total vehicles		135	
Engineers		137	

SOURCE: Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough?*, Harper & Row, New York, 1971, p. 148.

^aThe center region for NATO includes West Germany, Belgium, The Netherlands, and France; for the Pact, it includes East Germany, Poland, and Czechoslovakia.

^bIncludes five French divisions.

^cTwenty-two of which are Soviet, and 24 of which are East European, including 8 Czech.

Table 3

NATO AND WARSAW PACT TACTICAL AIR FORCES IN THE EUROPEAN
CENTER REGION IN MID-1968

Force	NATO	Percentage	Warsaw Pact
Number of deployed aircraft	2,100		2,900
Total worldwide inventories of NATO center region and Pact countries	10,500		7,200
Percentage of force by mission capability (center region):			
Primarily interceptors	10%		42%
Multipurpose fighter/attack	48%		15%
Primarily attack	9%		6%
Reconnaissance	13%		8%
Low-performance	20%		29%
Total	100%		100%
Effectiveness indicators (NATO as percent of Pact):			
Average payload		240	
Typical loiter time		250-500	
Crew training		200	

SOURCE: Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough?*, Harper & Row, New York, 1971, p. 155.

conclusions reached by the Office of Systems Analysis during the McNamara period. Specifically, military forces were seen as mixes of equipment and personnel, rather than as institutional embodiments of particular philosophies and concepts. The Enthoven viewpoint reflects the economist's penchant for finding the best combination among existing "production processes." By not questioning the philosophies and concepts underlying military organizations, Enthoven implicitly accepted these behaviors as *givens*, and limited his analytic scope to the search for a better mix of existing military "building blocks" rather than analyzing these processes and their appropriateness.⁵ The consequence was advocacy of marginal improvements, for example, "streamlining" forces in Europe by eliminating low-priority functions, such as redundant headquarters and support bases (REDCOSTE⁶), and "providing all the horse-shoe nails" needed to realize the full potential of NATO's existing conventional forces.⁷

To the degree that both adversaries are *qualitatively* similar, static comparisons such as given in Tables 2 and 3 are helpful indicators. When the sides differ radically in national characteristics (e.g., Israeli versus Arab) and styles of warfare (e.g., NATO's firepower versus the Soviets' shock power⁸), the indicators are less reliable. Although Enthoven's intent in Tables 2 and 3 was to demonstrate Western

⁵ *How Much Is Enough?*, p. 150. Enthoven in fact justifies American military practices (relative to the Soviets and other foreign armies) by the following logic: Army force planners must be satisfied with the current force structure because they have not proposed changes (i.e., moved to a higher "utility" position) when invited to do so. However, this analogy from economic theory presumes perfect knowledge and begs the question of the appropriateness of the processes underlying U.S. military practices.

⁶ For Reductions of Costs, Europe. Though the systems analysis goal was considerably greater, the final outcome was a saving of 6000 personnel and \$38.3 million annually. Hearings before the Subcommittee on U.S. Security Agreements and Commitments Abroad, Senate Committee on Foreign Relations, 91-2, 1970, p. 2023.

⁷ *How Much Is Enough?*, p. 156. This objective formed the basis of U.S. force improvement plans and of the European Defense Improvement Plan (EDIP), which was approved by the NATO Defense Ministers in December 1970.

⁸ To the author's knowledge, the distinction between firepower and shock power has never been carefully defined. One distinction is the

comparability vis-a-vis the WP, the numbers obscure significant differences between the NATO- and the Soviet-preferred systems of land warfare.

The Enthoven thesis rests largely on his assertion that NATO has a 50-percent superiority in antitank weapons. This assertion has been widely quoted, sometimes without the necessary qualification that these numbers refer only to M-day forces in the center region (Table 2).⁹

However, even with the center region limitation, the Enthoven inference is problematic. Foremost, he implies that NATO's 45-percent disadvantage in tanks is largely offset by NATO's 50-percent advantage in anti-tank weapons.¹⁰ Such an inference presumes that antitank weapons are nearly as effective as tanks in an antitank role and, assuming that, that antitank weapons are at least as numerous as tanks. Neither, however, is true. In the past, even large antitank weapons have not had the gun power, mobility, nor crew protection to compete with tanks, except under special "surprise" conditions.¹¹ Both sides, moreover, have considerably more tanks than major antitank weapons.¹²

relative emphasis on fire and maneuver. According to this distinction, a firepower-style army relies extensively on indirect fire support (i.e., mortars, artillery, and air delivery) to destroy the enemy by fire and to allow friendly forces to close with the enemy. A shock power army emphasizes maneuver to defeat the enemy and a higher proportion of direct firepower (tanks, assault guns, etc.) accompanying maneuver units. A second and better distinction, in the author's opinion, is between brute force and psychological impact. A firepower army tries to overwhelm its opponent by the sheer weight of its resources, like the Western Front in World War I and in 1944-1945, and more recently, in Vietnam. A shock power army tries to create the *impression* of great strength, often by reliance on mobility to augment its force by velocity (and deception) for the purpose of sapping the morale of its opponent and paralyzing his command and control. Two classic examples of shock power armies are Genghis Khan's Golden Horde and the German World War II wehrmacht.

⁹ See, for example, Brookings' *U.S. Troops in Europe*, which, moreover, credits NATO with an antitank advantage over all the WP forces available for the central front and not just those stationed in the central region. John Newhouse (ed.), The Brookings Institution, Washington, D.C., 1971, pp. 54-55.

¹⁰ *How Much Is Enough?*, p. 149.

¹¹ Second-generation antitank guided missiles (ATGMs) such as TOW will change this only to the extent that their range outdistances tank gunnery and that they are similarly mounted on armored vehicles.

¹² NATO has about $2\frac{1}{2}$ times more tanks than major antitank weapons; the Pact, four times. A major antitank weapon can be defined as one

In terms of major antitank weapons, the Pact has always outnumbered NATO; only if present plans are implemented within the next few years, and the Soviets do not react, will NATO obtain a quantitative edge over the Warsaw Pact.¹³ A Soviet motorized division now has about 85 partly armored major antitank weapons (exclusive of gun artillery); a U.S. mechanized division until recently had only 54 unarmored systems;¹⁴ and the German armored infantry division has 105 armored systems. French divisions have moderate antitank strength, but are very strong in tanks, particularly light tanks.¹⁵ Thus, while the two alliances' mechanized divisions average about the same number of major antitank systems, Pact divisions are smaller, and the Pact in Table 2 has about as many mechanized divisions as NATO has total divisions.

generally capable of defeating medium tanks at ranges of 1000 meters or more; such weapons have so far (but not necessarily in the future) been assigned to specialized antitank units.

¹³ In terms of *weapon* effectiveness, NATO's major antitank weapons in the near future will be considerably superior to the Pact's with the introduction of TOW, HOT, and other second-generation ATGMs. At the time Enthoven was writing (and for the weapons he was assuming), this was not true. Then the two primary weapons were a greatly inferior jeep-mounted 106-mm recoilless rifle and the SS-10 and -11, which are roughly comparable with present Soviet ATGMs.

In terms of *deployment* effectiveness, the Soviets have the advantage because of their emphasis on concentrated deployment, as well as the tactic of "mousetrapping" smaller tank units. Where the United States has one antitank section per rifle company, one AT platoon per infantry battalion, and a small aero weapons (helicopter) section per division, the Soviets have one AT platoon per infantry battalion, two AT batteries per infantry regiment, one AT battalion per motorized rifle division, and one AT regiment per combined-arms army.

¹⁴ Published TO&Es show this number dropping to 36 when the carrier-mounted TOW is substituted for the jeep-mounted ENTACs (the U.S. licensed version of the SS-11) and 106-mm recoilless rifles. However, modified TO&Es that have been very recently adopted for Europe have increased the number of TOWs to about the same number of major antitank systems as in the German mechanized division. United States totals (as adjusted for a six-infantry, four-tank battalion mechanized division) are from *Infantry Reference Data*, U.S. Army Infantry School, Fort Benning, Georgia, July 1970. Soviet approximations can be obtained from Army FM 30-102, *Handbook on Aggressor Military Forces*, Department of the Army, May 1966.

¹⁵ Although NATO armored divisions have almost as many antitank weapons as mechanized divisions, Pact tank divisions (comprising nearly half the total force) have only a third the infantry content of motorized rifle divisions and correspondingly only about a third as many major and minor antitank weapons.

Enthoven obtained his large antitank count for NATO relative to the Pact by an arbitrary distinction that counted some of NATO's infantry platoon antitank weapons, but not the Pact's. Thus, the 90-mm recoilless rifle in U.S. rifle platoons was counted, but the 80-mm RPG-7 at the Soviet squad level was excluded--even though both are about equally effective (or ineffective depending on the viewpoint). Yet if all such small, short-range antitank weapons are totaled, NATO turns out to outnumber the Pact even more than Enthoven had supposed: The German division has over 2100;¹⁶ the Soviet motorized rifle division, about 330; and the United States, only 117. Thus, while these numbers may be comforting, they also point out that the Alliance has a distribution problem. Some corps sectors are relatively strong in antitank weapons while others, like the U.S. sectors, have been weak. In high-tempo mechanized operations, such a distributional flaw can be fatal.

Furthermore, Enthoven based much of his antitank discussion on the following contention:

since NATO would be on the defensive along most of the front, its 50 percent advantage in *infantry* antitank weapons would be important. *Historically*, such advantages have enabled the defender to exact an exchange ratio of 3 to 1.¹⁷

This statement is revealing because

1. *Infantry* antitank weapons have historically only been partially effective against massed armor attacks. One reason is the infantry's inability to concentrate enough weapons at the point of contact. Second, the short range of infantry antitank weapons makes the crew vulnerable to enemy infantry by the time that enemy tanks come within range. Third, the short-range,

¹⁶ Several hundreds of these (one per infantry squad) are the Swedish 84-mm recoilless rifles, which were below Enthoven's 90-mm cutoff score for recoilless-type weapons and hence not counted. The remainder are unassigned *panzerfausts*, carried in brackets inside armored vehicles and trucks. In addition, all German riflemen can fire antitank grenades. However, the latter are really "desperation" weapons and are only effective up to ranges of 50 meters.

¹⁷ Italics added. *How Much Is Enough?*, p. 149.

poor accuracy, firing backblast signature and small warhead of some of these weapons (such as the World War II bazooka, which proved ineffective against Russian T-34 tanks in Korea) have often combined to make them be classified more as a psychologically important desperation weapon rather than as an effective antitank device. Fourth, since World War II the U.S. infantry's longer-range systems have generally been jeep-mounted guided missiles and 106-mm recoilless rifles, which have been very vulnerable to enemy indirect mortar and artillery fire.

2. The 3-to-1 advantage is a rule-of-thumb measure, applicable to *small* units in the attack and defense. Generalizing from the small to the large would be a fallacy in this instance. At the general level, the 3-to-1 rule applies only if each side relies on brute force and assaults each other across the battlefield. The rule does not apply if one side uses maneuver and surprise to obtain an advantage over the other, as a review of the history of military art would quickly indicate.

A second example of qualitative differences between NATO and the Pact involves actual combat strength. Enthoven's divisional manpower figures suggest that NATO is stronger in combat strength by having more men in divisions. However, only 23 percent of the personnel strength of a U.S. division is in actual maneuver platoons (infantry, tank, antitank, and cavalry) compared with the Soviets' 32 percent. Using Enthoven's manpower-in-divisions figure and assuming that U.S. and Soviet practices have been universally adopted throughout their respective alliances, the Soviets have a 29-percent *advantage* in actual fighting personnel.

Even more important is the 114-percent Soviet advantage in the number of tank and infantry battalions.¹⁸ Soviet battalions are only 29 (tank) to 47 (infantry) percent of the size of their U.S. counterparts; yet for certain circumstances, these small battalions are capable

¹⁸ Assuming an average of 10.5 tank and infantry battalions for $28\frac{2}{3}$ NATO divisions and 14 battalions for the 46 WP divisions that Enthoven compares. For a major implication in tactical nuclear warfare, see footnote 13, p. 43.

of projecting shock power comparable with that of the larger NATO battalion. The principal reason is that the Soviets fight for impact, and their units in the attack below the regimental level deploy almost their entire infantry and tank strength with specialized antitank units functioning as reserves.¹⁹ NATO practice is to deploy two-thirds of each unit, leaving a third in reserve--a practice that snowballs into a front-line division having only 18 percent of its tank and infantry strength on line and 82 percent in reserves at various command levels; the comparable Soviet percentages are 30 on line and 70 in reserve. Consequently, in circumstances where the Soviets have the initiative and can employ their shock power tactics so that their battalions have hitting power comparable with NATO's, they are able to lever up their small divisions to an effectiveness level approaching their advantage in maneuver battalions (114 percent).

On the defense, the Soviets' advantage drops to somewhere between their 114-percent advantage in battalions and their 29-percent advantage in actual combat personnel. Only if the Soviets were forced to fight the U.S. style of firepower warfare over a prolonged period would their organizational advantage disappear because of their inadequate ability to supply and maintain their forces in the required manner. Unfortunately, to force the Soviets into such a style would require outnumbering them to such an extent across the front that they would no longer be able to enjoy the initiative and to concentrate their sparse supporting elements on the sectors of main effort.²⁰

The remaining indicators used by Enthoven in Tables 2 and 3 are analyzed in detail in App. A. However, enough has been discussed to indicate their flavor: Enthoven accepted the validity of the current U.S. force structure and failed to appreciate that different styles of warfare had invalidated his indicators.²¹ The latter show only that NATO

¹⁹ For a further discussion, see footnote 2, p. 52.

²⁰ For a development of the rationales underlying Soviet organizational practices, see pp. 27-30.

²¹ In *How Much Is Enough?* (p. 136), Enthoven also mentions (but does not emphasize) that a U.S. division has "much more" firepower than a Soviet division. Firepower scores have limited significance when different styles of fighting are employed. Nevertheless, in terms of the

is paying for a comparable conventional force, not that it has received full value for its expenditures. Enthoven's comparisons are based on "inputs"; but when the "production processes" of two "firms" are not identical, as in this case, inputs are not a reliable guide to relative output.

The Enthoven thesis has the virtue of reducing the Soviet threat to a manageable size, and showing that the Alliance is in fact already paying the price for a comparable conventional capability. Unfortunately, his thesis has masked underlying structural problems and has thus been an inadequate basis for policy prescriptions. Enthoven contended that NATO's military problems could be resolved by making marginal improvements, such as constructing aircraft shelters; by eliminating unnecessary headquarters and support bases; and by ensuring that the allies imitate U.S. standards (an analytical error on several counts) and maintain larger war stocking levels. But these prescriptions address only the peripheral defects of the military system, not its basic doctrine and concepts where the fundamental problems exist and where the big savings lie.

HYPOTHESIS 2: ALLIANCE POLITICS CONSTRAIN MILITARY EFFICIENCY

Robert Osgood has forcefully expounded the hypothesis that NATO's security deficiencies are the "by-product of an agglomeration of domestic and foreign political pressures, undisciplined by coherent strategic guidance."²² Specifically, he contended that

firepower indices used by the Army's Resource Analysis Corporation, a U.S. armored division has about 45-percent greater effectiveness than a Soviet tank division; but it is also 115 percent larger in personnel. A U.S. mechanized infantry division is 20 percent more effective than a Soviet motorized division but 70 percent larger. Finally, a regular U.S. infantry division (about half of U.S. reinforcements) is about 10 percent less effective than a Soviet motorized division but 70 percent larger. When these comparisons are translated into terms of division slices (unadjusted, to distinguish from the later use of this term when slices will be compared on the adjusted basis of actual combat strength), the firepower advantage of U.S. units increases slightly but manning jumps to 3 times the level of Soviet slices.

²² *NATO: The Entangling Alliance*, University of Chicago Press, Chicago, Ill., 1962, p. 355.

At the root of NATO's resulting troubles is a complex of related strategic issues--all of them revolving around the central issue of the deployment, use, and control of nuclear weapons--which severely taxes the capacity of this peacetime democratic coalition to meet the requirements of allied cohesion with military plans that are adequate for allied security.²³

Osgood's contention is primarily based on the political difficulties of using destructive nuclear weapons in an alliance of sovereign members, each with their divergent interests. Thus, Osgood himself has implicitly stressed NATO's "sword" and assumed away the feasibility of creating a strong conventional shield,²⁴ as so many have done. Others (economists in particular) attribute NATO's conventional weakness to the parochialism that precludes a "rational" division of labor among the Alliance partners, greater economies of scale through cooperation, and innovative behavior in general. Since these arguments digress from the thrust of my study,²⁵ they are discussed in App. A.

HYPOTHESIS 3: NATO'S FORCES ARE MALDESIGNED

A third hypothesis contends that NATO's military problems (and many of its derived political problems) stem from the way in which its available resources are used to generate military power. Thus, it is suggested that analytical attention focus on the conceptual basis underlying the *design* and *use* of our military forces. Hypothesis 3, as postulated by this author, argues that

U.S. forces are not properly designed to perform their stated mission, and many of our allies have inappropriately adopted

²³ Ibid.

²⁴ In another passage, Osgood comes close to recognizing that the real problem is NATO's high-cost division slice (p. 397). However, in a slip of logic in the subsequent sentence, he concludes that democratic nations are incapable of exacting the requisite domestic sacrifices, ignoring his own acknowledgment that NATO is already spending more in money and manpower than the WP.

²⁵ In contrast, the Enthoven arguments are both a convenient springboard and the basis of much of current policy and public discussion.

a dated American military model. Attractive new policy options have been effectively foreclosed to decisionmakers because of the costly misdesign of U.S. and NATO forces. Contributing causes have been (1) the military establishment's overconcern with mechanical processes which has hindered the development of an overall perspective, and (2) the fascination with quantitative analytical tools that are inherently incapable of exposing qualitative flaws.

The basic assumption underlying the American military instrument is obsolete: classic, unconstrained nation-in-arms conflict relying on industrial potential and military expansion. This underlying assumption permeates the entire instrument--its strategic notions, organization patterns, resource allocations, and manpower policies.²⁶ Such an encompassing assumption based on past experience has inhibited recognizing and assimilating the opportunities and constraints imposed by nuclear weapons, new technology, and the realities of the Soviet military position. This American presumption has affected NATO through NATO's reliance on U.S. reinforcements and mobilization capacity and indirectly through American influence on the design and readiness of indigenous Western European forces.

NATO military objectives are deterrence and defense. Yet NATO, and the United States in particular, maintain all-purpose, offensive-oriented, sustained-war forces that do not optimize deterrence because of their low *initial* combat capability and their destabilizing tactical nuclear posture. A force structure oriented for deterrence and for fighting (and particularly in defending against) a blitzkrieg-style war can be bought at much less cost than at present--as best exemplified by Soviet forces in East Germany. Adjusted (equal front-line platoon strength, defined as infantry, tank, cavalry, and antitank) peacetime division slices (the division itself plus its share of nondivisional support personnel) for the field armies in Germany total approximately

²⁶ See, for example, S. Canby, *Military Manpower Procurement: A Policy Analysis*, D. C. Heath and Company, Boston, 1972, pp. 11-13 and 227-231.

42,000 for U.S. forces; 31,000, French; 28,000, British; 25,000, German; but only 19,000 for Soviet forces.²⁷ That is, for the same number of men in line platoons, NATO has in supporting capacities from .4 to 2.5 times more men in peacetime and almost $2\frac{1}{2}$ times more men in a short war than the Soviets would have.

Yet NATO as the defender should be able to buy even less expensive forces than the Soviets because it is not required to project offensive power beyond requirements for counterattacks within a basically defensive strategy. In fact, while NATO's political leaders talk about a strategy of Flexible Response and rapid escalation to the tactical nuclear level, NATO's military commanders have designed their forces for a war of indefinite length; while the political leadership thinks of the defense, the military planners continue to structure their forces under the adage that the best defense is the offense. These dysfunctional military practices manifest themselves in a host of subconcepts, which in turn determine organizational and tactical behavior and drive up NATO's costs to the point where it is assumed that the Alliance cannot match the combat strength of the Warsaw Pact without additional expenditures. This assumption, of course, will continue to be self-fulfilling until the underlying concepts are reappraised. The remainder of this report discusses some of these more significant conceptual issues.

²⁷ The U.S. slice excludes Berlin, SETAF, and almost 15,000 non-USAREUR army personnel in Europe. It does, however, include almost a thousand per division slice for the tactical nuclear support of allied forces and for maintaining prepositioned equipment stocks for ConUS-based units--a number that strictly speaking should not be charged against the U.S. slice.

The German peacetime slice appears small because graduated percentages of the wartime slice are reservists. The German fleshed-out wartime slice, as well as the French and British slices, is over 41,000. The U.S. wartime slice is normally considered to be 48,000 for planning purposes; the Army's Command and General Staff College, however, lists the theater army "type" slice as 54,000. The adjusted Soviets' slice (to reflect increases in U.S. manning of its TO&Es from level 2 to level 1) is apparently about 21,000 for a short war and about 24,000 to 25,000 if their army front organization were fully fleshed out, as in a prolonged conflict.

III. THE STRATEGY OF FLEXIBLE RESPONSE

NATO military planning has been shaped by outdated World War II concepts and by an exaggerated view of Soviet strength. The combined effect has been to rule out the possibility of building a strong conventional defense--thus serving to emphasize NATO's dependence on nuclear weapons.¹

During the period when the United States commanded a credible first-strike capability, the nuclear emphasis was cost effective, despite its questionable premises about the infeasibility of mounting a conventional deterrent. In fact, so successful was the American nuclear umbrella over Western Europe that it reinforced the Soviets' perception of needing to devise their own countervailing and equally awe-inspiring posture aimed at holding Europe hostage to U.S. good behavior.

ASSESSING ALTERNATIVE STRATEGIES

In the past, whether NATO's strategy has been called "trip wire" or "flexible response," it has been based on an asymmetrical power relationship vis-à-vis the Warsaw Pact. NATO deterred the Soviets with the offensive threat of strategic nuclear weapons, and the Soviets deterred the United States with conventional forces and with IRBMs aimed at Western Europe. This equilibrium has now been perturbed. The Soviets have attained direct deterrence against the United States, while retaining their European "hostage" capability. Indeed, the Soviets may soon obtain a position of military dominance in Europe. They have long enjoyed conventional superiority and in the last decade an equally dangerous (if less sophisticated) tactical nuclear capability and have now obtained effective parity in strategic nuclear systems. If NATO is to regain a viable military balance, NATO must be roughly equal in each of these aspects or compensate for weakness in one by stressing another, as in the asymmetric system that has held until recently.

¹During its earliest period, NATO's deterrent power was the military potential inherent in the U.S. mobilization capacity.

NATO now has a high-risk military posture consisting of weak conventional capabilities, capped by rough balance vis-à-vis the Warsaw Pact in the tactical and strategic nuclear components. The situation is increasingly dangerous because NATO's earlier strategic nuclear advantage has become increasingly neutralized. And the apparent solution--buying more conventional forces--has been viewed as foreclosed by its high cost.

A return to strategic superiority is a hypothetical possibility for NATO, but no sustained U.S. effort that might provide a permanent advantage appears likely. National policy embodied in the SALT agreements also precludes this alternative strategy.

Tactical nuclear superiority is another problematic possibility. Its major drawback is the qualitative crossing of the nuclear threshold with its concomitant destructiveness. Dependence on tactical nuclear weapons would, in effect, lower the nuclear barrier without providing another qualitative threshold (aside from the distinction between superpower versus nonsuperpower homelands--a distinction that lesser powers may not respect). The appeal of tactical nuclear weapons is their substitution of technology for manpower; however, numerous studies have questioned this presumption and have suggested, to the contrary, that manning requirements would increase if both sides were to use tactical nuclear weapons.²

²How Much Is Enough?, p. 125. Although this contention is probably true, the assumptions used by these studies were invalid. They assumed the present U.S. structure rather than a military structure streamlined for tactical nuclear warfare. Such forces can be stripped of much of their conventional artillery and logistics, and maneuver battalions themselves have to be restructured into smaller battalions presenting more than one aiming point. When such restructuring changes are included, rather than assuming present practices, ground force slices could be reduced by a factor of about three from the present wartime slice of 48,000. Navy and Air Force forces are affected even more. Tactical nuclear warfare presumes a short war. Large Navy sea-lane forces would therefore no longer be required. Air Forces could be reduced even more now that Army surface-to-surface missiles have become so technologically advanced that they in effect dominate air-delivered tactical nuclear weapons in attribute characteristics. Tactical nuclear war also emasculates the application of conventional tactical air because of air base survivability.

Much of the appeal of tactical nuclear weapons is a residue from the mid-1950s, when the United States possessed an undeniable technological lead in this area.³ Many analysts (particularly technologists) have advocated that the United States try to recapture its earlier advantage by developing cleaner, small-yield nuclear warheads and by improving targeting and delivery systems. Such improvements would make tactical nuclear weapons useful for finite point targets rather than for indiscriminate area targets, thus reducing collateral damage and permitting close-in fighting with nuclear weapons. The difficulty of the "clean and small weapon" approach is the implicit assumption that both sides have similar tactical nuclear postures, which is not now the case. To date the Soviets have emphasized large-yield, indiscriminate terrain fire weapons, many of them based in the Soviet homeland, which precludes the possibility of "limiting" a tactical nuclear war. Should the Soviets adopt similar clean and small weapons based in forward areas, NATO's original problem of insufficient combat forces would reemerge and highlight an anomaly of the NATO force posture--the notion of relatively few but high-quality, sustainable combat forces rather than the Soviet notion of larger numbers of smaller, less sustainable forces equipped with cheaper, less sophisticated equipment with a shorter life expectancy.

Thus, NATO can no longer hope to overcome its conventional weaknesses by stressing strategic or tactical nuclear weapons. The only

³ An extensive literature developed in the late 1950s on the question of whether nuclear weapons favored the defense or offense. Most notable in these discussions was the failure of the analysts to investigate the military structure of the opposing alliances. It was commonly accepted that the United States had a ground force compatible with tactical nuclear war because the U.S. Army had proclaimed its pentomic divisional organization in 1957. In reality, the reverse was true, as belatedly recognized by the Army itself in its 1962 ROAD division. One problem was that the Soviets were mechanized while the United States and many of our NATO allies were still largely foot infantry until the early 1960s. Foot infantry lacks the tactical mobility, armor shielding, and small-arms fire necessary for the close-in protection of dispersed units, which are all required for tactical nuclear warfare. Other problems are that the Soviets have equipped themselves better for tactical nuclear warfare (see footnote 3, p. 62), and their blitzkrieg doctrine and organization is better suited for tactical nuclear warfare than NATO's.

remaining choice for NATO, which has appeared to date to be infeasible, is the development of strong conventional forces. Realistic suggestions for improving NATO's military posture must focus on reducing the cost of these needed forces within the context of graduated deterrence.

PROBLEMS OF FLEXIBLE RESPONSE

The declared strategy of Flexible Response is plagued by four problems. The most obvious is the apparent high cost of providing sufficient conventional forces. However, as argued in the following sections of this report, this financial constraint is largely attributable to NATO's having bought the wrong *type* of forces. A second problem is that the conventional phase of any future European war will require mutual restraint, yet the current asymmetries in strategic as well as conventional force postures would be most likely to induce instability and early escalation to nuclear weapons. Since the Soviets have organized their conventional forces to overrun Western Europe quickly in a short war, it is highly probable that either NATO (as structured at present) would feel pressured to opt for tactical nuclear weapons (to inhibit the Soviet onslaught) or that the Soviets would preempt.⁴ Third, our European allies have always been dubious about the deterrent value of Flexible Response.⁵ Fourth, the strategy of Flexible Response without an adequate conventional basis is a dangerous strategy for an alliance. Designed to provide time for thoughtful consideration of nuclear alternatives, Flexible Response as structured now tends to invite an enemy strategy of lightning invasion, against which NATO is least prepared to defend, and subsequent negotiation in order to fragment an alliance under stress.⁶

⁴ The Soviet view and its associated problems are dealt with in App. C.

⁵ European attitudes toward Flexible Response are discussed in depth in App. B.

⁶ Advocates of this theoretical position either assume NATO is militarily as strong as the Pact (the Enthoven thesis) or are unaware of the realities of Soviet blitzkrieg tactics and that the loss of West Germany forward of the Rhine would effectively terminate NATO's capability for

Upon reflection, however, it is clear that NATO's problems with Flexible Response stem not from an inherent illogic, but from faulty implementation. The strategy of Flexible Response, now that the Soviets have obtained strategic parity, holds meaning only insofar as NATO can wield a viable conventional defense against the concentrated ground forces of the Warsaw Pact. Indeed, conventional comparability is crucial if central Europe is to be defended and the nuclear threshold to be avoided. By posturing itself for the sustained, long-term fighting of the last war, NATO may not survive to respond--flexibly or otherwise--after the opening battles of the next war.

Thus, NATO's forces must be restructured to allow time for a Flexible Response; this can best be accomplished by preparing to fight the kind of war that our potential adversary is contemplating. Indeed, if the Soviets are harboring aggressive intentions under cover of SALT and other détente gestures, NATO's provision of a better shield is a top-priority problem. If, on the other hand, Soviet intentions are benign, then conventional comparability would be likely to produce mutual force reductions and a lower-cost military standoff in Europe.

mounting a conventional war because of the loss of German resources and the probable disintegration of the Alliance.

Nonautomaticity of a nuclear response in the context of armored warfare and a known conventional weakness can allow the opponent a "free" move. If he fails to defeat NATO completely in a very short time span by overrunning Western Europe or splintering the Alliance and is forced to suspend operations to avoid nuclear warfare, he has at least annexed, with little subsequent recourse from NATO, substantial portions of resource-laden German territory. For the exception due to asymmetric strategic vulnerabilities, see pp. 84-86.

IV. THE SOVIET MILITARY QUANDARY: AN INFERIOR RESOURCE BASE

NET THREAT ASSESSMENT

NATO retains a persistent conviction regarding the invincibility of Soviet conventional power. This image stems from several sources:

1. Remembrance of historic Russian "steamroller" tactics that sought to overcome Western organizational and technological superiority by sheer weight of numbers.
2. Moscow's seemingly monolithic control of much of the Eurasian land mass and population during NATO's formative period.
3. The large Soviet active forces that were maintained after World War II.
4. The constant Soviet effort to project an image of overwhelming ground strength.

It can also be argued that this invincibility theme has been fostered in part by Western military leaders, who have on occasion used the tactic of frightening their own governments into larger defense appropriations (and may have become victims of their own propaganda).

But although NATO may be deceived by these images, the Soviet leadership has made a more realistic assessment of the Warsaw Pact's potential war-fighting strength. The comparisons of Table 1 show that the Russians are no longer on the side of the alliance with the greater aggregate resources, as in World Wars I and II. Though no longer a backward giant, the Soviet Union is now unpleasantly situated between Japan and China on one side and a West united against it on the other. Russia is thus faced with the possibility of fighting a multifront war against quantitatively superior opponents. The Soviet Union's major vulnerability is its need to maintain two nonmutually supporting armies--one in Western Europe and one on the Sino-Soviet border. Recent reports of the Institute for Strategic Studies indicate that a quarter of Soviet

ground forces are now stationed in the Far East. Only the tenuous Trans-Siberian railroad links these forces at present.¹

One of the Soviets' advantages in these potentially disastrous circumstances is alliance cohesion. The Pact is dominated by the USSR, whereas NATO is composed of sovereign states with divergent national interests that inhibit unified planning, effective cooperation, and speedy decisionmaking. On the other hand, while the USSR depends on a number of smaller client states of questionable loyalty² and military capability, NATO contains such traditionally stalwart and martial countries as Germany, Britain, and France, with a combined GNP almost as large as the USSR's and a population two-thirds as large.

Of clearer advantage is that Pact forces can be more easily concentrated within Europe because of shorter internal lines of communication (i.e., greater ease in shifting forces among the center region and the flanks). NATO is spread thin on a coastal littoral and is consequently vulnerable to piecemeal defeat because of force imbalances and reinforcement difficulties among geographical areas. In particular, only 28 percent of NATO's strength (27 division equivalents including 5 French) is located in the critical center region. Though a comparable 27 percent of Pact strength (60 divisions) is similarly located in the GDR, Poland, and Czechoslovakia, the Pact can mobilize and reinforce much more rapidly than NATO. For example, by M + 30 to 60 days, NATO could deploy at most only 6 to 9 additional U.S., British, and French division equivalents in central Europe (including 5 air portable-type divisions of limited

¹ These forces could only become mutually supporting in a short war if expensive investments were made in heavy tank transport units or in equipment prepositioning, so that personnel on one front could be airlifted and married with equipment on another. Using one group as a personnel replacement pool for the other is of limited value for the Soviets in a short war, because the Soviets use a different replacement system than NATO and cannot replace equipment losses along with personnel replacements.

² Although speculations about future loyalties are always tenuous, most analysts contend that the Soviet client states would fight well only if their own homelands were attacked. However, the reverse is also plausible: that the Soviets can depend on their allies only as long as the Soviets appear to be winning and their overall power remains viable. The crunch comes if the war becomes prolonged and pressures begin to mount against the Soviets.

value),³ whereas the Soviets could deploy an additional 50 mechanized divisions.

Although possessing more short-term, mobilizable strength, the WP is at a considerable long-term, resource disadvantage vis-à-vis NATO. The Soviets cannot hope to win by past rudimentary steamroller tactics, where the defender was swamped in a human wave attack that had no larger purpose than the immediate attack itself. But while the Soviets are keenly aware of their resource disadvantage (a tenet of Marxist-Leninism is that modern military power is based on economic prowess), how does it happen that NATO perceives them to be unmatchable in conventional power? The answer to this apparent paradox is simple: The inferior side cannot fight *on the same terms* as its superior opponent and expect to win. Rather, the inferior side must take at least one of two steps: (1) develop a superior military system, as Germany did with its panzer armies in World War II, or (2) develop a more rapid mobilization system in order to defeat the enemy before he can organize his superior resources, as Germany tried to do in 1914. The Israelis, for example, are generally credited with both capabilities against the Arabs. Thus, as the resource-inferior power, Soviet "win strategies" are limited to those that preclude NATO's development of its much greater military potential.⁴ Consequently, the Soviets prefer a quick offensive, and they have accordingly developed a rapidly deployable reserve system, as the Europeans did before World War I. Doctrinally, the Soviets have adopted and improved a German blitzkrieg system; organizationally, they have retained a number of steamroller practices that have led to considerable economies. In essence, the Soviets have developed a superior military system for waging a short war.

³ See footnote 18, p. 75. The Germans have large numbers of reservists to flesh out their peacetime divisional structure and to form territorial defense units, but have made no provision for additional divisions and brigades. The Dutch and Belgians could possibly field 3 to 4 foot infantry reserve division equivalents, but these would have little military value.

⁴ An important point is that consequent Soviet capabilities, which appear to be offensively oriented, are dictated by military necessity. Aggressive intentions cannot be assumed. Of course, if war were to occur, the Soviets could be expected to take the offensive, as did Germany and Israel, in accordance with the well-known Western military maxims of "seizing the initiative" and "the best defense is a good offense."

OBTAINING CONVENTIONAL MILITARY SUPERIORITY FROM RESOURCE INFERIORITY

The Soviets' conventional warfare system can best be appreciated from the perspective of their two primary military objectives: neutralizing and offsetting U.S. strategic power (prior to the Soviets' own strategic buildup), and maintaining their domination in Eastern Europe. In retrospect, the Soviets must be credited with military cleverness. While Western Europe rebuilt its strength under shelter of the American security umbrella, the Soviets managed to rebuild an even more devastated economy and to retain and further develop a conventional force capable of holding Western Europe "hostage" as an indirect counter to the U.S. nuclear threat. Overwhelming ground power coincidentally resolved their potential Eastern Europe problems. The question that has never been fully explored is *how* the Soviets could create such a force with fewer potential resources and a smaller peacetime military budget.

The deterrence problem required the Soviets to maximize visibility of their force. In essence, their success was due to brilliant improvisation in finding ways to minimize their *logistical* support needs so that most of their resources could be channeled into high visibility *combat units*. Appendix D outlines in some detail the Soviets' methods for reducing their logistical tail requirements. These can be summarized under four headings: blitzkrieg military strategy and doctrine, Russian steamroller tactical and organizational practices, stringent peacetime operating procedures, and a quick war mobilization system. The last two relate more to operating economies and less to tactical doctrine and are discussed in App. D.

The most important Soviet method is the blitzkrieg doctrine. German armored tactics provided the conceptual basis for overwhelming an opponent quickly. The tactic is to concentrate on narrow sectors of the front in order to break through the opponent's defenses and then to pour into his rear areas, enveloping his main forces and paralyzing his reactions. If only one or two breakthroughs are required because of the opponent's weakness or lack of depth, the enemy can be defeated in a matter of weeks, as occurred early in World War II.⁵ Against stronger

⁵ The Germans were surprised by the unexpected success and tempo of operations wrought by their panzers. Their French and British and later

opponents, a series of breakthroughs may be required before the enemy is sufficiently weakened and collapses.

A second important implication of blitzkrieg tactics is their effect on logistical requirements--an insight that the Soviets exclusively seem to recognize. First, if a breakthrough is decisive against a relatively weak opponent who lacks depth to his position, the war will be over before the armored breakthrough force needs extensive maintenance, repair, and replacement. NATO is potentially in this situation because at a march rate of 100 km per day, as called for in Soviet doctrine, the Rhine River and the Dutch border are only 1 to 3 days' march from the border in middle and north Germany. In such circumstances, a large logistical tail organic to Soviet divisional units (and logistics in general) is not only an unnecessary expense, diverting resources from greater numbers of combat units, but also the tail restricts divisional mobility by requiring protection and clogging road space.

Second, blitzkrieg tactics use armored forces in such a way as to require relatively little logistical and indirect fire support. Large-scale fire and logistical support is required only during the heavy fighting of the breakthrough phase.⁶ Once a breakthrough occurs, an armored penetration exploiting the enemy's disorganization requires relatively little artillery and logistical support. Providing divisions and corps (usually called armies in the Soviet lexicon) with their own logistical capability for such infrequent occurrences as breakthroughs would thus obviously be inefficient.

their Soviet opponents were considerably stronger in terms of men and matériel, including tanks. The Germans were therefore psychologically and organizationally unprepared at the beginning of the war to exploit fully their blitzkrieg innovation. Later, the Germans were limited by their automotive capacity. Infantry divisions organized to maintain themselves for long periods in the front lines were the German work-horses and were used to make the breakthroughs for the limited numbers of panzer divisions. The Soviets have simply developed the logical implications of the German system. Because they have had years to accumulate equipment, they have been able to mechanize their entire force and to organize for a much higher tempo of operations than the Germans.

⁶ Assuming that the enemy has strong forward defenses (which NATO does not have in central Europe) and that tactical nuclear weapons are not used to "blast" open a breakthrough gap.

The Soviets' solution was an adaptation from their steamroller organizational practice.⁷ Divisions designed to swamp enemy defenses do not need an elaborate infrastructure. Moreover, the Soviets, following their early disasters in 1941-1942, were forced to strip divisions of skilled specialties and concentrate them at higher command levels. The Soviets have thus grown accustomed to sparse support. The Soviet innovation was in recognizing that these organizational practices were a natural complement to their blitzkrieg doctrinal system. Since high-intensity blitzkrieg combat occurs only along narrow sectors of a wide front, higher headquarters (in this case the Soviet Front) can concentrate logistical efforts to provide a support framework in which combat divisions and even armies are to be used like drill tips on a high-speed drill--to be ground down and replaced until the penetration occurs. After the penetration, when the divisions are rapidly exploiting their advantage, these divisions no longer require extensive artillery and logistical support from higher headquarters.⁸

Against weak opposition, the techniques of concentrating support are facilitated by low overall demands and heavy fighting within only narrow sectors. Even against strong opposition (such as having to face a U.S.-style offensive with forces distributed more or less equally across a broad front), the support framework technique is made viable because (1) the Soviets have the resources to create more divisions than can be conveniently fought simultaneously, and (2) losses among support troops are always much smaller than among combat maneuver

⁷ Steamroller tactics are characterized in Soviet divisions by a relatively inflexible command system and a rigid system of echeloned forces with few intermediate reserves (except for antitank). Western military observers tend to deprecate this system without realizing its leverage in terms of support economies, the high percentage of troops in actual contact with the enemy, and how an enemy lacking replacement divisions can be worn down by a side using replacement divisions to maintain round-the-clock pressure (see footnote 2, p. 89).

⁸ This does not mean that the streamlined Soviet divisions are incapable of heavy fighting without support from higher headquarters. The Soviets hedge against this possibility by providing their divisions with enough organic support until they can be reinforced from higher headquarters. This phenomenon is best evidenced by the high ratio of artillery tubes and cheap multiple rocket launchers organic to divisions relative to resupply capacities.

units.⁹ This means that logistical imbalance is feasible, and more combat units can be created than can be logically supported in combat simultaneously.¹⁰ Thus, once a threshold of a minimum level of divisions is reached, the possibility arises of stripping support from divisions and building support frameworks at higher command levels from which large numbers of divisions can operate.

A POLICY IMPLICATION

The strength of the Soviet conventional system is deterrence--against both NATO and revolution in Eastern Europe. Deterrence during the critical period when the United States had a credible first-strike nuclear capability required stressing an offsetting ground capability in Europe. At the same time, however, because Soviet conventional superiority was entirely based on a conceptually more advanced military system than that in vogue in NATO, Soviet conventional superiority was fragile and its use had to be circumscribed so as not to induce a countervailing Western reaction. Pushing NATO too hard carried the danger of inducing either a NATO reappraisal of its military concepts and a cheap countering of the Soviets (by copying Soviet innovations) or an expensive Western rearmament based on variations of the accepted U.S. model. Either could have foreclosed the Soviets' opportunities of winning a conventional war and would have undermined their strategic position. Thus, just as U.S. nuclear superiority was not usable except as a weapon of last resort, Soviet conventional power against Western Europe was also a weapon of last resort, as long as the asymmetry in nuclear delivery capabilities remained.¹¹

⁹ For instance, in World War II, U.S. Army enlisted casualty rates were ten times higher in the infantry, armored, and armored cavalry than the average for the other branches. Within a division, a rifleman was, respectively, 15.4 and 24 times more likely to become a casualty than a truck driver and an auto mechanic. G. W. Beebe, M. E. Debakey, and Charles C. Thomas, *Battle Casualties*, Springfield, Ill., 1952, pp. 38 and 42.

¹⁰ This reasoning is further explained on pp. 50-55.

¹¹ A decade ago this conclusion would have had significant policy implications. As long as the Soviet strategic position required holding NATO "hostage" by a readily imitated military system, Soviet

SUMMARY

The Soviets have labored from an adverse strategic position. Initially, they lacked nuclear weapons and the resources to fight a conventional war as normally perceived. Yet they have managed to overcome their difficulties and operate from a position of strength--a position that can only be strengthened with their attaining nuclear parity with the United States. Their key strategic recognition was that resource constraints, as well as the omnipresent threat of nuclear escalation, made a short war concept preferable.¹² Their implementing military techniques synthesized blitzkrieg doctrinal concepts at the higher command levels with traditional Russian steamroller tactics and organizational practices at the division level. This has permitted a high teeth-to-tail ratio and consequent higher visibility of military power.

decisionmakers would have been reluctant to entertain seizure of Hamburg-type scenarios which could have jeopardized their tenuous strategic position for short-term tactical gains. For a discussion of present constraints on the Soviets because of the strategic interface, see pp. 84-86.

¹²See also footnote 3, p. 90.

V. THE SHORT VERSUS LONG WAR PROBLEM

To state the problem starkly: If NATO continues to ignore its short-run combat weaknesses, NATO's long-run capabilities will be rendered useless by the Pact's initial onslaught. A military force postured logically for a short war can usually also fight a long war if necessary, provided long lead-time items are hedged and economic resources are available. But a military force that is structured for a long war (and consequently weak in short war capabilities) may not survive to marshal its potentially superior power.

Less than 30 percent of present U.S. costs for NATO are directly related to fighting a short war in the crucial central region. The incremental costs associated with maintaining a long war capability account for almost one-half of our total NATO expenditure (see Table 4). This does not mean that other capabilities should be entirely eliminated; they perform important political functions, and the possibility of a long war cannot be dismissed. But the point is quite clear: The United States is not allocating enough for the primary problem and is expending too much for issues of secondary importance.¹

Much more is involved than calculating the cost of stockpiles and their means of delivery, as most U.S. analyses have done.² The

¹ A contributing cause is that the U.S. military view a European war as another World War II. Present forces in Europe are regarded as a protective screen for the deployment of large U.S. forces after about M + 12 months. The Europeans find this strategy unattractive and have not prepared for it. Accordingly, an asymmetry exists between U.S. and European war length capabilities. While the United States has tried and failed for years to induce the Europeans into buying greater war reserve stocks, it is nevertheless true that as long as the Europeans do not, little is gained by an expensive U.S. unilateral long war capability.

² The costs of war reserve stocks are trivial compared with the large savings that could be obtained by drastically reducing the supporting units and manpower essential for a long war and an all-purpose offensive expeditionary force. Studies showing the savings from reduced stocks or tradeoffs between stocks and delivery capabilities thus focus on the wrong problem and also come to biased conclusions because of the unnecessarily large division slice used to calculate costs and requirements.

Table 4

BREAKOUT OF TOTAL U.S. COSTS IN NATO BY PRIMARY PURPOSE

(In billions)

Force	Total Present Costs ^a	Center Region Short War Costs	Center Region Long War Increment To Sustain Short War Capabilities	Other ^b
Active Army forces ^c	8.3	4.1	4.1	0.1
Army Reserve and National Guard	2.1	--	2.1	--
Active Air Force tactical air ^d	5.7	2.6	2.6	0.5
Reserve Air Force tactical air	0.8	--	0.8	--
Airlift and sealift	0.6	0.6	--	--
ASW	3.3	--	2.3	1.0
Carrier task forces	2.6	--	--	2.6
Other naval	1.1	--	--	1.1
Marine landing team	1.1	--	--	1.1
Total	25.4 ^e	7.3	11.9	6.4

^a"Estimated Cost of U.S. General Purpose Forces for NATO and European Contingencies by Region, Fiscal Year 1972," *U.S. Troops in Europe*, The Brookings Institution, Washington, D.C., 1971, p. 119.

^bIncludes flank protection, political contingencies in the Mediterranean, etc.

^cShort war costs optimistically assume $3\frac{2}{3}$ divisions can be deployed rapidly enough from ConUS to Europe to affect events. About half of active Army costs can be charged to the long war account.

^dAir Force costs are difficult to sort out. Aircraft were bought for air-to-air combat and long-range interdiction with tactical nuclear bombs. Many are still allocated for these missions. The tactical doctrine for conventional war and the support structure are only consistent with a long conflict. In addition, although airpower is flexible, some is stationed in the Mediterranean region. I have arbitrarily (but optimistically) assumed that at least half of active Air Force costs are related to a short conventional conflict in the central region.

^eRounded total.

Europeans, too, have failed to recognize a fundamental contradiction in their force structures. They have not bought nor made provision for war reserve stocks for a protracted conflict, but they have unwittingly retained a number of expensive structural practices consistent only with a long war, as indicated by their large division slices (see pp. 17-18). NATO's land forces are thus layered with sustaining resources necessary only for a long war; its air forces have inherited a conventional war doctrine that assumes a long war, and many of its aircraft were designed for long-range tactical nuclear interdiction; and, of course, its ASW forces are mostly relevant for *hedging* against a sea-lane dependent long war (and attriting and intercepting Soviet ballistic missile submarines during a conventional pause or during their movement to station). In a world of peacetime budget and *real* (i.e., physical) wartime resource constraints, choosing to build a long war capability reduces the resources available for the more dangerous and more likely short war alternative.

The key argument in the conventional short war thesis is that the Pact must defeat NATO rapidly or it will itself be defeated by weight of NATO's superior resources. Indeed, the critical Pact goal is the Rhine River; if the Pact can reach the river within a few days, many of NATO's divisions would be cut off and defeated piecemeal, thus foreclosing the possibility of viable defense of the Rhine.³ On the other hand, if the Pact required several weeks to reach the Rhine (because NATO was relatively successful in limiting repeated Pact penetration efforts), it is very likely that either NATO would still hold the flanks of the Soviet penetration salients or that NATO units would successfully withdraw behind the Rhine. In the latter case, the Pact would still effectively win with its capture of West Germany because it would be very difficult for NATO to launch a successful counteroffensive across the Rhine, even after the arrival of extensive U.S. reinforcements.

³ Moreover, large amounts of equipment would have had to be abandoned because of breakdowns and easy-to-repair battle damage. World War II experience shows that loss of the battlefield just about doubles tank losses. Possession of the battlefield is also particularly important for the Soviets because their maintenance and repair system is organized for on-site repair rather than for the U.S./NATO system of vehicle retrieval.

If the Soviets could not cross the Rhine while the balance of power was heavily in their favor and before the defending side could fortify the barrier and recover from the confusion of a major defeat, it cannot be expected that a predominantly American force could ever make a re-crossing and a subsequent counteroffensive to recover lost territory. (In World War II the United States was able to form only 89 divisions.) Yet much of U.S. planning has been implicitly based on replaying this World War II scenario.

If NATO were able to hold the shoulders of the Pact's penetration salients and counterattack or successfully defend against the Pact's armored threats, a transitional stalemating situation would develop as the balance of forces shifted from the Pact's initial combat advantage to NATO's greater conventional war-making resources and industrial superiority--provided, of course, that provision were made for adequate supplies during the transition period. However, such a scenario requires more divisions than NATO has. These divisions are now largely deployed on-line with few in reserve--a distribution that can be fatal in armored warfare. If NATO were to restructure its present forces and mobilization practices, as suggested in this report, it could have twice as many divisions from its present manpower strengths. If most of these additional divisions were placed for defense in depth and in reserve, Soviet breakthrough tactics would have little chance of success. Thus would arise the possibility of a long war. As the war progressed, the Pact's combat capabilities would diminish without extensive logistical reinforcement.⁴

Indeed, once a stalemating condition developed, the Pact, which would be keenly aware of its internal limitations, would have every incentive to seek termination of the war as soon as possible, while still appearing strong and still possibly holding NATO territory for bargaining.⁵ At

⁴ Logistical reinforcements would buy little for the Pact because (1) a restructured NATO could also shore up its logistics, (2) the Pact's logistical reinforcements would be "bought" at the expense of industrial capacity needed for a World War II-style conflict because the Soviets partly denude themselves of critical civil transport and engineering capabilities upon mobilization, and (3) the effort would only prolong a conflict that the Pact could no longer expect to win.

⁵ Added incentive for the Soviets would come at this point from reorienting NATO's forces from the defense to the offense. A mechanized

this temporary stalemating juncture, NATO would share an incentive to seek termination of the war because of the uncertainty created by its recent, possibly near defeat, its yet-to-be-developed strength, and continued danger of nuclear escalation. (However, as the military balance shifted to NATO's favor, NATO might flex its rapidly growing relative strength and be disinclined to accept the *status quo ante*, as in the Korean case in late 1950, thereby inducing the Pact to escalate.)

A conventionally weak NATO virtually ensures a short war. Although the preceding argument has been based on conventional operations, NATO's recourse to tactical nuclear weapons after a conventional pause can at best only marginally prolong the war. More likely, tactical nuclear weapons will shorten the conflict. With a weak conventional defense, early recourse to tactical nuclear weapons may initially impede any Soviet advance to the Rhine, but thereafter the tempo of operations will considerably quicken and even weaken the ability to defend the Rhine barrier. Interdicting the Soviets' lines of communication will be of little avail because their divisions, meeting weak opposition and using nuclear weapons in lieu of conventional artillery for creating gaps in NATO's defenses, would require only minimum resupply. NATO's problem is to target the leading elements, which would be difficult unless its defense can slow the attack and cause attacking units to concentrate sufficiently and long enough to constitute a meaningful tactical nuclear target.

More important, if the Soviets believe the statements emanating from responsible Western officials to the effect that NATO would quickly escalate to tactical nuclear weapons in case of a serious Pact offensive, the Soviets have an incentive to preempt. They would thereby gain the inherent benefits of a first strike and the considerable savings derived from designing forces for only a short conflict. (For other Soviet objections to a long conventional war in Europe, see App. C.)

A final point in distinguishing between short and long war capabilities is that no sharp discontinuities exist. A scenario calling for a

force oriented to the defense can be rapidly reoriented to the offense by beefing up logistics and by adding tank units to the divisions spearheading the offensive.

90-day capability does not imply that Day 91 will bring defeat or a non-capability. Arguments regarding such discontinuities usually have an emotive intent or, if sincere, are biased by an exclusive focus on "days of resupply."⁶ Most items of support (e.g., maintenance) do not end abruptly but run down continuously. The same is true even for stock-piled war consumables. Days of supply is a measurement unit based on expected rates of consumption. It does not take into account the effects of rationing, which is a standard operating procedure when stocks become low. Finally, in terms of the argument of this report, if the military's objection to a short war is primarily due to the fear of running out of supplies, a very cheap solution would be to buy more prepositioned stocks in order to obtain the military's cooperation in reducing its unnecessary structure.

RESISTING TEMPTATIONS

NATO should resist the strategic temptations (at least until an adequate initial defense in the center region is satisfied) of diverting resources from the center to the flanks and to maritime forces that have little relevance to the initial central land battle or that are designed to protect the sea lanes for a long war. The propensity to channel resources to noncritical areas has been justified by clichés (e.g., "an army without supplies cannot fight") and fallacious generalizations (e.g., referring to macro-issues on NATO's flanks in terms of inappropriate micro-concepts, such as "outflanked" or "cut off"), some of which presume a long war. NATO's critical aspects are *time* and its *center region*. If Western Europe collapses before its inherent strength

⁶ The U.S. Army bases days of supply (and such other planning factors as projected loss rates) on World War II and Korean experiences, as stated in FM-101-10-1, *Staff Officers Field Manual Organization, Technical and Logistical Data*, Department of the Army, January 1966. This seemingly innocuous criterion introduces all sorts of problems ranging from how supply requirements are calculated to how logistical assets are distributed. FM-101-10-1 is perhaps the most explicit indicator that the U.S. Army remains organized to fight a long war as in World War II. Theoretical Army discussions of logistical concepts are valid in principle and can therefore mislead the layman who is not aware that the Army implements these concepts in terms of its past experiences of sustained, across-the-front-style conflicts.

can be organized, sea-lane protection, control of the Mediterranean, and defense of the flanks would subsequently be difficult and even meaningless.

As long as Western Europe itself is not threatened, resources may be temporarily deployed to the flanks, thus demonstrating NATO solidarity and inhibiting Pact encroachments designed to nibble away at NATO or to undermine its morale and cohesion. But if the Soviets were to concentrate against Western Europe, even minor deployments to the flanks would risk sacrificing the primary region for the sake of secondary regions. A Pact onslaught must concentrate on NATO's central region both because of the Pact's own vulnerabilities and to preclude the possibility of allowing the key NATO industrial nations time to develop their superior but latent military resources.

In case of a conventional war between NATO and the Warsaw Pact countries, the decisive conflict will be in Germany; barring a stalemate, the outcome there will also determine the outcome on the flanks. Thus, it is a disservice to view Greek and Turkish forces as part of an overall allied order of battle with the role of diverting and tying down Soviet forces away from the center region. Because the Soviets must concentrate their effort on the critical center region, the most effective assistance to Greece and Turkey would be constituted by a strong central sector that would reduce Soviet pressure on these countries. Furthermore, much of NATO's flank terrain is rough and spacious enough to block and subsequently to absorb, harass, and attrit large enemy forces by light and knowledgeable local troops using barrier and unconventional tactics.⁷ Finally, the air and ground forces of such

⁷ For example, the Yugoslavs have developed a territorial defense model that is supremely suited to their special geography and secondary status in the world power equation. They realize they cannot defend conventionally against a large power, but by defending unconventionally they can embed a very large force attempting to occupy and pacify the country. No attacker, of course, would be willing to expend this level of resources in an area of secondary importance. Thus, the Yugoslavs have developed a deterrence strategy based on their secondary status. But such a strategy would be inappropriate for Western Europe.

The present NATO-wide strategy of a forward mobile defense is unsound for Greece and Turkey. These countries can only compete with the Soviets in a conventional war by relying on barrier systems and rugged terrain to immobilize Soviet armor so that light infantry (as opposed

countries as Italy and Portugal serve no real NATO function, unless they are used to replace potential central region forces (e.g., Italian troops releasing German troops in Bavaria for duty in the North German Plain). Thus, the current flow of military resources (a quarter of the U.S. NATO commitment and some British and Canadian elements) from the center to the flanks should be reversed. This policy reversal, of course, is inhibited by the perspectives of the flank countries, who naturally view themselves as bearing the brunt of a Soviet attack, and by the traditional alliance credo that the stronger should aid the weaker.

Nor should the military importance of blocking a Soviet naval penetration into the Mediterranean be overemphasized. The narrow and treacherous channel of the Bosphorus can be readily blocked. Moreover, part of the Soviet surface fleet is permanently assigned (or was until very recently) to the Mediterranean with supply facilities on the Arab littoral. The cliché that the Mediterranean lifelines are critical to NATO is of questionable validity and largely a residue of the British lifelines-to-India thesis. What is now important is oil, particularly in a long war requiring European industrial mobilization. For a short war (say, up to 90 days), NATO military bulk requirements are already partly met by military storage and in any case could be met by expropriating only a very small percentage of what is stored on the Continent for civil purposes. Finally, the Soviet threat against this lifeline has been used by the U.S. and NATO military establishments to justify stronger air and naval forces in the Mediterranean. But what lifelines are there to defend if the Soviets control the Arab oil source through peacetime political penetration? The lifeline problem is thus as much

to the heavy infantry of the U.S. model) could effectively cope with Soviet tanks. An unconventional territorial defense strategy that gives way before Soviet power but continually harasses the occupying force and causes a large army to become bogged down would be effective against Soviet armored forces, which are not designed to fight against an amorphous opponent in rough terrain and in close quarters. Finally, since a light infantry posture is suitable for both barrier and unconventional warfare, these countries could choose a mixed, sequential strategy of barrier defense and then unconventional territorial defense. For a detailed elaboration of these themes, see G. Pauker, S. Canby, A. R. Johnson, and W. Quandt, *Fostering Self-Reliance in the Third World: U.S. Security Assistance under the Nixon Doctrine*, The Rand Corporation, R-1092-ARPA, 1972.

political as military. Even for a long war, a stronger 6th Fleet is only one aspect of the problem.

NATO's high expenditures for surface and ASW fleets (15 and 13 percent, respectively, of total U.S. NATO costs)⁸ are logically inconsistent with the Alliance's strategic requirements. Flexible Response should be viewed as a truncated land strategy in a nuclear context that essentially excludes a long conventional phase. Surface fleets have almost no General-Purpose-Force relevance in such a conflict; their primary relevance is blocking relatively ineffective Soviet surface ASW against Polaris. The few carrier-based aircraft that would be available, beyond the demands of fleet defense, for supporting the ground war are too distant to have more than marginal impact. Tactical nuclear missions can now (as opposed to a decade ago) be better performed by less vulnerable missile systems. NATO ASW capabilities for sea-lane protection should be viewed as a hedge against the possibility of a long war. The requirement for strong in-being ASW forces could be avoided by larger peacetime stockage and more prepositioned equipment for reinforcing U.S. units (especially if divisional slices can be sharply reduced, as argued in this report); stocks are cheaper than ASW.⁹ Finally, carrier task forces are not needed near the NATO environs to counter Soviet surface ASW. Land-based airpower forecloses the surface option to the Soviets except near their own coastal seas where their land-based air denies NATO a surface option.

⁸ See Table 4, p. 33.

⁹ In addition, ASW would not be essential for economic support of NATO countries in a short war. The needs of civilian industrial production would decline sharply, and basic commodities such as food and fuel could be rationed or even warehoused as in West Berlin.

The Navy might argue that if NATO ground forces were essentially defensive and NATO ASW forces were weak, the Pact could stand back and attempt to defeat NATO by economic strangulation with its submarines. Such an argument, however, neglects the strategic interface. Not only is this strategy provocative and inviting of a countervailing reaction, but it requires deploying the Soviet sea-based deterrence force. Even if NATO's ASW capabilities were considerably weaker than they are at present, a long shipping blockade (required to be effective) could be debilitating to the Soviet sea-based deterrent forces. See also pp. 84-86.

NATO has invested heavily in traditional blue-water surface fleets that have little war-fighting relevance. Only in their own coastal areas and in the confined Eastern Mediterranean, where the Soviets have opted for a shallow draft fleet composed of small missile ships operating under Arab-based fighter cover, do the Soviets pose a serious sea-denial challenge to Western surface ship naval supremacy. But naval supremacy is neither critical nor a relevant *wartime* issue in the Eastern Mediterranean,¹⁰ and NATO has never had the need to contest control of the Soviet coastal seas.

What has happened is that the war-fighting functions of surface naval craft have become confused with their political value. The two aspects are no longer coextensive in the nuclear era. In today's world NATO can do little about Soviet fleet activities in peacetime. NATO cannot attack Soviet ships without risking war. And in a short war, a classic war-at-sea would have little relevance to the land battle even if the Soviets had the option. The value of NATO's surface fleet is political (and for limited military contingencies) and only secondarily for war-fighting. Although such political and contingency functions as flag showing, displays of force and determination, etc. are obviously important, they should be viewed as political and not be used to justify expensive war-fighting capabilities. Moreover, once it is recognized that the fleet's primary value in the European environs is non-military, the present emphasis on fleet readiness can be correspondingly modified to reduce operating costs, and alternative postures and fleet design may be adopted for greater cost effectiveness.

Ironically, if we are really concerned about a European war (as opposed to political penetration of Third World areas), NATO should welcome the Soviet surface fleet buildup. Because of limitations resulting from the geographic locations of their bases, the Soviets would need to reallocate considerable resources to reach a viable war-at-sea threshold. The more they attempt to reach this threshold, the more they play a U.S.- and NATO-preferred strategy by shifting resources

¹⁰ If it were, NATO could counter this Soviet force much more effectively through land-based aircraft and small missile ships operating from the many islands of the Aegean Sea.

from primary to secondary goals in a "game" in which NATO has the more favorable exchange ratio.¹¹ In the Western Mediterranean and Atlantic, the larger Soviet ships are in effect NATO hostages due to their lack of fighter cover and constricted maneuver space.

The Soviet surface fleet is a sea-denial fleet originally designed for deployment in the Soviet coastal seas. Its mission has been to abort carrier and Polaris nuclear strikes aimed at the Soviet homeland. As the standoff distances have increased from longer-range carrier aircraft and undersea missiles, the Soviet surface fleet has had to deploy outward in reaction to the U.S. nuclear threat. In particular, as long as carriers (and Polaris) are deployed in the Mediterranean, the Soviets can be expected to react accordingly. NATO and the United States should recognize that deploying carriers with their highly advertised nuclear capabilities in the confined Mediterranean may unnecessarily expose these high-cost systems and has goaded the Soviets into a countervailing naval deployment. Thus the United States may have fostered--probably irreversibly now that Soviet decisions and investments have been made--a Soviet naval presence and a mini arms race in the politically sensitive Mediterranean.

CONCLUSION

For NATO, the initial war-fighting period would be critical. To meet this crisis, the long-term sustaining capabilities organic to and in support of NATO's divisional units will serve little function. (In fact, these swollen support units would probably hamper NATO combat units by increasing road congestion and by delaying move-and-close operations.¹²) Therefore, NATO cannot afford these long-run sustaining

¹¹ Shifting the focus of a conflict from land to sea might also increase the resolve of the Europeans and decrease Soviet political opportunities.

¹² General Ralph Haines, Commanding General of CONARC, has vividly described this phenomenon as follows: "We have become so vast [at brigade and division levels] we may trip over our own entrails, while trying to maneuver on the battlefield." "Haines Warns of Tripping on Trivia," *Army Times*, June 7, 1972.

resources until its short-run combat requirements have been satisfied. When it becomes apparent that a stalemating situation is arising, these sustaining resources could be added to the force structure in the form of integral units and incremental add-on packages to already existing units from the reserves; other sustaining resources could come from stripping logistical assets from U.S. forces deployed elsewhere that might be oriented for a protracted conflict or in support of Third World allied forces.

Because the Soviets have designed their forces to peak early, a similar force design would enable NATO to match the Pact's initial combat capability without creating a long-run vulnerability. If NATO is concerned only with deterring and defending itself against the Pact, as stated in declared policy, NATO's force posture in the critical center region should emphasize strong antitank defenses with tank-heavy reserves. And NATO need only sustain its forces just slightly longer than the Pact. The crucial point is that unless NATO wants to outspend the Pact in land forces (the decisive element), NATO must obtain its "outlasting" sustaining resources *relative* to the Pact by organizing properly for the defense rather than for the offense--not by trading off initial combat power for the sustaining resources needed only for a long war. NATO would then have at least as great a war-fighting capacity as the Pact in the initial conventional category, while improving its tactical nuclear posture and retaining superiority in mobilization potential. In short, exchanging the current NATO long-run capability for larger numbers of smaller divisional forces would have an optimizing effect: greater deterrence, greater conventional and tactical nuclear war-fighting capabilities,¹³ a higher nuclear threshold, and cost savings from a reduced need for large protective naval forces.

¹³Factoring out the sustaining power organic to U.S. units means smaller maneuver units as well as a smaller logistical tail. Smaller units mean smaller "signatures" for enemy target acquisition, fewer losses per attacked target, and manpower savings that can be used to create more combat units.

As discussed on p. 13, the Soviets have already done this. Consequently, the author would argue that those who contend that the United States is better prepared than the Soviets for tactical nuclear warfare are focusing on tactical nuclear delivery systems, not tactical doctrines, organization, or equipment design. In the latter three categories, the Soviets seem to be considerably better prepared.

VI. FORCE STRUCTURE: ITS RELATIONSHIP TO STRATEGY
AND SPECIFIC DEPLOYMENT AREAS

Most military leaders pay lip service to the notion of "consistency" in designing their forces; that is, they want their force structures to reflect the nation's strategic goals, as well as objective environmental conditions. Yet although consistency is an appealing principle, it is relatively hard to find in practice because major powers must often avoid the consistency criterion to maintain the flexibility inherent in an all-purpose force needed to meet diverse military requirements. With notable exceptions, such as Yugoslavia and Israel, smaller powers suffer from the disease of emulation, even though their military requirements are usually quite specific. Large military organizations have historically been preoccupied with their own internal mechanics and have been reluctant to adapt to new contexts and enemy styles. Smaller powers tend to imitate what they perceive to be well-thought-out and experience-proved concepts of the prestigious big powers. As a result, national force structures are often not designed for their intended use, and considerable savings could be realized by tightening the relationship between form and function.¹

Global powers in particular face the dilemma of developing either specialized forces suited for distinctive missions or general forces adaptable to any conflict. The United States, with its wide range of

¹ A structurally efficient military force must be specifically designed for the characteristics of the geographic area in which it will be used. Strategy, tactics, organization, and equipment should reflect the total environment and be sensitive to such factors as mission and scenarios, geography and climate, nature of the threat, and extent of economic development. New technological developments can also be included in this list. The special problem here is that technology is too often used to shore up dated concepts and practices, rather than to stimulate innovative behavior.

Unfortunately, military establishments are seldom sensitive to such factors. The American Army--preceded by the French--ran into difficulties in Vietnam because of this insensitivity. The Soviets have had a parallel experience in the Middle East, where the Israelis partially credit their military successes to the Soviet failure to adapt their European-style armored warfare to Middle East conditions.

foreign commitments, has stressed flexibility and has opted for an all-purpose force. The Soviets are new to global responsibilities and still maintain forces specialized for combat in Western Russia. Coincidentally, both countries are using models that first appeared in the early forties: The United States explicitly adopted the French model² just prior to World War II, and the Russians adopted the German model in the period between their early World War II defeats and their Stalin-grad counteroffensive.

In the post-World War II period, the two superpowers provided both the military models and extensive military assistance for their respective alliances. The Pact countries in particular have followed a standardized Soviet model. In NATO's center region, the impact of past American military assistance has somewhat faded, and the strong national

² The dominant personality behind the American Army reorganizations was Lt. Gen. Lesley McNair, who was a firm believer in infantry pre-eminence and in stringent streamlining. Extensive field testing in 1937-1938 led to a recommendation for a streamlined triangular infantry division closely resembling the then prestigious French model, with the notable exception of a reduced American emphasis on tanks and antitank means. The division that finally emerged in 1939-1940 was considerably larger than the one recommended by General McNair, particularly in the realm of support. During World War II, moreover, field preferences for ever larger units were honored, including the parcelling out of most tanks to infantry divisions in 1944. Although the United States maintained a higher ratio of armored to infantry divisions in Europe than the Germans (26 percent for the United States versus only 18 percent for the industrially constrained Germans), the U.S. military system remained philosophically wedded to infantry preeminence. Not only were most tanks frittered away in infantry support, but the armored division itself formed the largest U.S. armor group (compared with the German and Soviet practice of grouping tank armies) and was generally assigned on the basis of 1 armored and 3 infantry divisions per corps (as is still the practice for the standardized formations used in the U.S. Army's schooling system). Specialized army literature of the period reveals much of this debate. The best single source is *The U.S. Army in World War II: The Organization of Ground Combat Troops*, Historical Division, Department of the Army, Washington, D.C., 1947.

Partly because the United States and Britain remained wedded to infantry preeminence, the Germans were able to deploy approximately 55 percent of all their divisions and 69 percent of their armored divisions on the Russian Front. The Anglo-American armies engaged only 37 percent of all German divisions in Italy, France, and the Low Countries. Percentages are from T. D. Stamps and V. J. Esposito, *A Military History of World War II*, Vol. I, United States Military Academy, West Point, N. Y., 1953, pp. 651-652.

characteristics of these countries have reemerged. Nevertheless, a subtle residue of American influence has remained, even in West Germany. In NATO's flank countries, however, reliance on the U.S. model and U.S. military aid has remained strong and has inhibited a search for doctrines more suitable to their special situations.³

The all-purpose American model suffers from inefficiency because a number of factors have been overlooked:

1. All-purposing should apply more to the strategic reserves than to permanently prepositioned forces and those reserves specifically marked for reinforcing one theater (as in Europe).
2. The loss in effectiveness of all-purpose forces may outweigh the savings attributed to flexibility.
3. The savings possible from specialization often cut through the rationale for all-purpose forces. By permitting strategies and force structures more tuned to specific contexts, the cost of divisional slices can be so reduced that a much larger number can be fielded.
4. Flexibility can often be better achieved by varying the mix of more specialized forces, because "specialization" recognizes context distinctions while "generalization" considers such distinctions already adequately accounted for.

The Russian model has the converse problem. It is too Europe-specific for effective deployment elsewhere. Yet the Soviet model is far more appropriate to the European context than the American.

Furthermore, the all-purpose American model is not effectively attuned to the declared strategy of Flexible Response. The American force is offensively oriented, with a built-in logistical system capable of indefinite support. However, Flexible Response calls for a defensive stance with a logistical system oriented for a short war, but hedged against the lower probability of a long war. For example, an offensive force must emphasize expensive tanks; a defensive force can trade off expensive tanks for cheaper antitank weapons (and still have

³See Pauker et al., op. cit.

more tanks for major counterattacks because fewer tanks have to be parceled out to defending infantry units). A defensive force can also rely extensively on prepositioned supplies and mobilized civilian assets, while a force projecting itself forward needs an elaborate logistic system to maintain its more actively used combat equipment, to move its supplies forward, and to repair a transport network damaged by a retreating enemy. Furthermore, short conflicts generally imply lower maintenance requirements (equipment can be permitted to run down), fewer engineers (networks will sustain less damage), and far fewer logistic troops in general.

Another feature of the all-purpose posture is the expensive design of standardized equipment suitable for geographic and climatic extremes (as opposed to standardized equipment families or series).⁴ As the NATO countries have replaced American equipment with systems of their own design, this feature of global standardization is less in evidence, though still costly for U.S. deployments. Contrary to popular belief, global standardization is not always economical. For a short war, at least, such standardization may lower effectiveness and raise costs. The common item may be overrestrictive (e.g., mechanized infantry should not be restricted by low-rate-of-fire weapons designed for foot infantry) or embody features that may be necessary in one conflict situation but superfluous in another. Although standardization per se simplifies training and maintenance and leads to R&D and manufacturing savings, trying to standardize for environmental extremes may actually entail (1) greater initial costs; (2) greater maintenance and operating costs; and (3) system degradation because of system complexity and greater downtime than simpler equipment suitable for only specific world areas, such as the nondemanding European theater. In short, the economies from standardization have been misinterpreted: The economies from standardization are from multination use of common equipment and equipment families, not from standardizing equipment to bridge a wide spectrum of environmental possibilities.

⁴The European countries have adopted a number of successful equipment series, such as the French AMX and the FRG Leopard armored vehicle families. The Soviets follow a variant of "Volkswagening" their changes:

A final defect of the American model is its expeditionary force organization. Based on experience in past wars, American forces are deployed overseas in balanced expeditionary packages capable of satisfying most of their own logistical needs. Expeditionary organization reduces dependence on nonnationals and it increases unilateral capability for some contingencies. But the price of these logistical riches (in terms of real world opportunity costs) is the loss of considerable combat power. If forces deployed in Europe did not need to be logically balanced for a long war capability and could be "plugged into" the local economic infrastructure so that even more logistical units could be eliminated, substantial increases in combat power would be possible.

The large American Army logistical tail is not explained by reference to a long Line of Communications (LOC) or by high standards of living--as many have erroneously concluded from such visible symbols as the PX. In fact, the Soviets have a longer land LOC than the U.S. Army. The high cost of the U.S. LOC stems from maintaining large naval forces to protect the sea lanes; this is not an "Army" cost. Army costs are unloading at the docks and transporting to Army users. However, in peacetime, Army personnel mainly supervise; the actual LOC work is done largely by civilian employees and civilian contractors. The land LOC cost is thus only a minor manpower factor and does not explain the large differences in military strengths among Soviet, European, and U.S. divisional slices. Correspondingly, the high living standards rationale does not explain the large U.S. divisional slice. The Soviets provide comparable services, particularly medical, for their personnel. Standard-of-living differences are largely a matter of degree and, in any case, these services are mainly provided by civilian employees, at least in peacetime.

In short, the large differences in wartime division slices among

Once a successful piece of equipment is adopted, such as their tank engine, it remains in the inventory for decades. The United States, unfortunately, has not followed either of these practices. Contributing reasons have been the relative lack of cost pressures, the push for technology for technology's sake, and too many competing companies (i.e., excessive rather than just "workable" competition).

the Soviets, Europeans, and the United States can be explained by the degree to which force structure is related to a short war and to a European context.⁵ The Soviets are geared for a short war; the Europeans and the Americans remain structurally geared for a long war. The Soviets and the Europeans have oriented themselves for Europe; the Americans, for global deployment. Because all three have been offensive-oriented, specializing for the defense should enable NATO to organize a division slice smaller than the Soviets'.

⁵ An additional factor explaining peacetime differences is the European and Soviet practice (except for the GSFG) of fleshing out their peacetime structure with reservists.

VII. OPERATING PRACTICES: CONSISTENCY AND COST EFFECTIVENESS

The processes by which resource inputs are translated into outputs and relevant military capabilities have been neglected. Systems analysis and operations research have been concerned with the mix or trade-offs among the inputs and outputs but have not focused on how the inputs have been converted into outputs nor their relevance. Management engineering has examined the processes but has accepted as "given" the underlying rationales and institutional boundaries. Analysts have thus focused on only one analytical track, whereas *two* exist:

1. Quantitative analysis to appraise those issues that can indeed be isolated from strategy and force structure and thence sub-optimized.
2. Qualitative analysis to ensure the logical consistency of military practices with the somewhat subtle implications of strategy and force structure.

The big payoffs, however, will most often not be found in quantitative analysis and its derived suboptimizations, but in evaluating structure and operating practices from the broader perspective of strategy and, perhaps most important, the thought patterns that drive a military's doctrinal concepts, organizational patterns, equipment designs, and--derived from these--its resource allocations.

A QUALITATIVE EXAMPLE: THE IMPLICATIONS OF INDIVIDUAL

VERSUS UNIT REPLACEMENT

In the NATO-Pact comparison, the most important operating difference is the replacement system for wartime combat losses. NATO emphasizes *individual* replacement; the Pact, *unit* replacement. NATO's combat units are sized on the assumption that units ought to be big enough to absorb substantial casualties and still function. Soviet units are sized for maximum shock, are incapable of sustaining serious losses, and must periodically be replaced and refitted. Although the topic of replacement systems may seem overly technical, significant organizational implications emanate from the choice of replacement systems.

Of the two systems, individual replacement is more attractive in protracted infantry wars, where the combat focus is diffused among all line units. Thus, individual replacement systems are most appropriate under the assumptions of World War II, Korea, and Vietnam, where sustained conflict and a tactical philosophy allocate effort (and supplies) more or less equally across the front. If losses are low enough that replacements can be readily absorbed, maintaining an experienced and functioning team is a realistic and desirable objective. The key, of course, is the assumption of few casualties.

Unit replacement is the more suitable system for tactical nuclear conflicts, short conventional wars, and the focused penetration/exploitation tactics of blitzkrieg-style conflicts.

Unit systems obtain their advantage by recognizing that all front-line units do not require equal support. Rather than assigning support to operate organically within each unit (as is NATO's practice even at battalion level), unit replacement systems in effect curtail support of units in secondary areas and concentrate support on the divisions required for the main combat effort. The key choice here is between the "across-the-board" and the "pencil" tactic, which has been made famous by the controversy between Generals Eisenhower and Montgomery. Most European and many American military professionals would now concede that the across-the-board philosophy is no longer desirable.¹

Unit replacement more closely corresponds to NATO's specific requirements. If the Soviets follow their tactical doctrine, NATO losses in the attempted penetration areas will be exceedingly high. This would rule out the absorption criterion needed for effective individual replacement. Moreover, if losses are high, many combat units will be

¹ Nevertheless, many force comparisons and war game models are based on firepower indices that presume the across-the-board rationale. Conclusions based on inputs from firepower scores need to be heavily qualified because of the different presumptions underlying combat styles. Soviet forces emphasize *shock power*; the U.S. Army, *firepower* (see footnote 8, p. 9). This introduces a host of sticky problems that have been dispensed with by the convenient assumption of similarity in organization and tactics. Such an assumption is perhaps valid at the lowest platoon and company levels, but findings at this level cannot be aggregated or generalized to army and theater, which are the levels of policy interest.

destroyed while their support survives. Therefore, it would be wise to plan for a wartime imbalance of more combat units than would otherwise be logically supportable. To use an analogy: If spear tips are a high-loss item but shafts are not, a one-to-one relationship is undesirable and more tips should be bought. Even if the war should be long, unit replacement remains preferable because it pools and thus economizes on required support features. Finally, if a tactical nuclear war occurs, individual replacement is no longer physically possible, and the requirement for built-in sustaining power can be sharply reduced.

Another important characteristic of unit systems is their ability "to surge" their combat power for short periods and to develop almost as much power as larger units organized for sustainability.² Designing

²The Institute for Strategic Studies (ISS) estimates that "the conventional firepower of a Soviet division is as great as that of most divisions in NATO" (*The Military Balance 1968-1969*, p. 7). The ISS reasoning is apparently based on the fact that the much smaller Pact division (slightly more than half the size of a U.S. division) has almost as many men and weapons in actual combat maneuver platoons (infantry, tank, antitank, and cavalry) as does NATO. Hence, the ISS argument is based on absolute numbers of actual combatants *within* the division. In addition, the smaller Soviet units are able to leverage their raw quantitative strength because

1. They usually have considerable surge capacity through the use of automatic weapons and other devices whose firepower cannot be sustained.
2. They are more easily controlled and manipulated due to their smaller size.
3. They are employed like their larger Western counterparts but, being smaller, place pressure on unit commanders for more imaginative tactics.
4. Perhaps most important, they gain several advantages from the way their tactical reserves are employed. Whereas NATO has a triangular organization (i.e., a span of control of three subordinate maneuver units) that typically allocates one-third of each command level to a reserve, the Pact uses a larger span of control at regimental level and above and has specialized, economy-of-force antitank reserves. The results are that (1) the Soviets are better prepared than NATO for stopping armored attacks and counterattacks (dismounted infantry attacks are too slow to be decisive); and (2) in the attack the Soviets are able to throw a high percentage of their maneuver platoons into the initial impact (30.0 percent versus the United States' 17.8 percent) and still retain a larger division reserve (46.0 percent versus the United States' 40.0 percent), which is critical in armored warfare. The Soviets, therefore, fritter away less of their line strength

units for surging rather than for staying power and sustainability results in more units for a given number of personnel. This effect is desirable for three reasons:

1. It increases command flexibility by having more units of comparable combat power when necessary.
2. It allows the formation of large reserves from replacement units for defense in depth to block armored penetrations and to launch encircling and decisive counterattacks.
3. It strengthens tactical nuclear war-fighting capabilities by both increasing the number of aiming points and reducing their signature (i.e., probability of detection), thus passively reducing the effectiveness of enemy nuclear weapons.

As opposed to sustained infantry conflicts of the past, the advantages of the surge effect are quite apparent for (1) the more sporadic requirements of mobile armored warfare; (2) short wars where sustainability is not important; and (3) tactical nuclear war-fighting where combat units must balance between being as small as possible to reduce their signature and yet powerful enough to be viable against conventional tactics.

The replacement system also has a direct impact on reinforcement schedules and the size and type of war reserve stocks. NATO has large manpower and equipment reserves, including, reportedly, 5000 tanks in war reserve stocks.³ But with an individual replacement system, NATO's

in intermediate reserves (24.0 percent versus the United States' 42.2 percent), which basically adds additional weight to an ongoing attack and protection against counterattacks, rather than providing an instrument for striking decisively from another direction or exploiting an advantage. The Soviet deployment is also more advantageous in nuclear warfare, for a larger fraction is linearly hugging the opponent. The triangular U.S. system is inherently more vulnerable within any destruction radius because of its higher troop density.

³ *Washington Post*, October 30, 1970. For an account of the tank inventory in Europe and the Army's rebuttal to the *Post* article, see *DOD Appropriations for 1972, Hearings, House Committee on Appropriations*, 92-1, pp. 577-581. A number of other anomalies exist in NATO mobilization and reinforcement procedures. The U.S. Army, for instance, prefers a peacetime balance between combat and logistical units and deploys logistical before combat units. However, scenarios dominated by such

manpower and equipment reserves must essentially stand by until losses in existing units create a vacancy for their absorption. The Pact, on the other hand, organizes its reserve manpower as "fillers" for a large number of extant peacetime divisions, most of which are kept at moderate and low-strength levels. As a result, the Pact has a large number of organized divisions that can potentially swamp NATO because their buildup can occur more rapidly. Thus, the unit replacement system also partially accounts for the Pact's mobilization and reinforcement advantage.⁴

A final advantage of the unit system is that its stringent allocation of maintenance resources makes peacetime operating economies mandatory.⁵

features as surprise, short- and high-intensity conflicts, or prevention of *faits accomplis* suggest the opposite disposition, namely, the operational deployment of a high ratio of combat to logistical units.

⁴ Another impact of the replacement system is how it interfaces with wartime expansion plans. The large difference in the total peacetime U.S. Army division slice (71,000 men) relative to the FRG (27,000) and the Soviets (11,000) is due to the mobilization base the U.S. Army maintains for wartime expansion. (The Soviets and Germans use a quick war mobilization system. Their non-field force overhead is consequently comparable; the Soviets' total drops because they maintain large numbers of understrength Category II and cadre Category III divisions, whereas the Germans maintain a limited number of 12 nearly full-strength divisions.) Whereas the Soviets and Germans do much of their advanced individual training in operational units, the United States maintains advanced training centers in each of its branches (e.g., signal, ordnance, infantry). In addition, the United States maintains "pools" of "unit unassigned" officers and NCOs in various schools and headquarters to gain the requisite experience for rapid promotion during wartime. The Soviet Army, however, as well as the Israeli and others, continuously promotes its officers to their initial required wartime rank. Even when assigned to peacetime duties elsewhere, these officers are assigned to operational units. The American emphasis on the peacetime readiness of active units precludes such practices.

The result of these differing mobilization and training practices is that the U.S. Army has a much higher overhead than foreign armies, and consequently much larger overall division slices and relatively few divisions. If the United States could rapidly organize this overhead into combat forces, the distinction would be moot and purely of an accounting nature. Unfortunately, the lack of peacetime cadre cores precludes rapid organization. Instead, U.S. units upon mobilization must be generated *de novo* if regulars are used, or from the reserves who lack the hard cadre core of professional experience and expertise necessary for attaining high unit proficiency, as can be deduced from the well-known fact that readiness of reserve units is inversely related to unit size.

⁵ Individual systems have a choice and may operate similarly if the logistical system is skeletonized as in the FRG. The Germans include

Military men, who understandably prefer to exercise their commands to develop operating proficiency, tend to overlook two disadvantages of constant training exercises: high operating and maintenance costs and lower equipment readiness in time of war. High training and readiness standards place U.S. units on a treadmill, causing portions of the logistical system to operate at high levels of capacity even in peacetime. Because such practices cannot be supported in unit systems, cheaper training techniques must be devised and equipment must be stored--procedures that do not seem to have detracted from the Soviets' apparent readiness.

The positive advantage of peacetime storage is higher equipment readiness at the onset of war and reduced maintenance after the war begins. The appropriate analogy is that unit systems begin a war with fully charged batteries; individual systems, with partly charged batteries. The Pact countries, for instance, put their combat equipment in covered storage in peacetime and explicitly assume that equipment will run down in wartime. In the case of the Soviets, the ultimate price (see App. D) is a steady degradation of combat capabilities after about 30 days of combat because of an inadequately expandable peacetime maintenance base. But by having their equipment in better condition than NATO at the beginning of hostilities, the Soviets can fight during the initial period with fewer mechanical breakdowns. By the time the Soviets feel the effects of inadequate maintenance, they will either have already won or will be in a stalemating position leading to eventual defeat unless the conflict can be terminated. From the Soviets' viewpoint, buying expensive logistics will foreclose their opportunity to win a short war while improving their capability in a long war, which they cannot expect to win anyway.

QUANTITATIVE EXAMPLES

Although the replacement system probably represents the greatest single example of potential savings through analysis of operating

their logistical structure in their peacetime posture but keep their strength low. The Bundeswehr practice is to allocate peacetime personnel by means of a sliding percentage scale, whereby front-line units are kept at almost full strength and the most rearward units at less than half strength.

practices, other conceptual traps exist in present operating practices that are not as interconnected with strategy and force structure and can be legitimately suboptimized with quantitative techniques. Many of these pitfalls result from the military's unwillingness to realize that it lives in a world of opportunity costs. Perceptions held by senior commanders, based on earlier experiences as company and battalion commanders, have caused military decisionmakers to opt for unconstrained "best" solutions at the micro or unit level--which ultimately degrades overall, *system-wide* performance because fewer of these micro-optimal units can be bought.

For instance, the "equal mobility" thesis (that supporting units should have cross-country mobility comparable with tanks) causes a preference for tracked over wheeled combat and combat-support vehicles and complex tactical trucks over rugged commercial designs. Another example is the notion that the tank is the best antitank weapon, which has inhibited the exploitation of new antitank and armored-wheeled vehicular technology. Still another is the "flexibility of artillery" thesis, which overlooks the cost and rate-of-fire benefits of mortars and multiple rocket launchers.⁶ Analysis of these and other doctrinally entrenched practices could produce major potential savings, as well as lead through the back door of the military's doctrinal fortress.⁷

⁶ For example, in a U.S. infantry division in "defense of position" about 47 and 10 percent, respectively, of all resupply tonnage are for artillery and mortar rounds. Yet the firepower scores for these weapons, as developed by the Army's Resource Analysis Corporation, in an infantry division (of 9 infantry and 1 tank battalions) are almost identical. Moreover, manpower requirements for the mortars are only 40 percent as great as for division artillery. A mortar round attains its weight effectiveness vis-à-vis artillery because of its more perpendicular impact angle, thinner shell casing relative to explosive charge, and reduced propulsion charges. For an additional discussion of artillery, see pp. 63-66.

⁷ The Soviets economize by using these more rationalized procedures. The Europeans fall between the United States and Soviet extremes. The Bundeswehr, for instance, relies extensively on tracked vehicles but has substituted rockets for some artillery and relies on commercial variants for trucks.

VIII. CONCLUSION

At the outset, the question was asked, Why is NATO *outspending* the Pact, in terms of both men and money, while apparently buying *less* security? This so-called people-PEMA¹ paradox, which so perplexed the McNamara analysts, can be resolved by examining the assumptions underlying NATO's organization for defense. The Pact, consciously or not, has developed operating procedures and a force structure appropriate to its strategic requirements in a European context; NATO, and particularly its U.S. component, has not. Rectifying NATO's military structure could effectively release the resources necessary to implement Flexible Response and forward defense, and concurrently remove some difficult political choices. The most crucial question is whether NATO should opt for highly visible, high initial combat capable forces (as the Soviets do), or retain low visibility, low initial combat but sustainable forces.

NATO's military disability is largely structural. Yet few NATO students have recognized this, which has led them to prescribe answers to the wrong questions (and sometimes even incorrect answers to the wrong questions). The search for greater uniformity and standardization among NATO forces is one example of the failure to recognize the problem; it sounds logical but proves erroneous in practice. Given budget constraints and the preeminence of the American military model, the result might have been the universal adoption of an inappropriate American model with a concomitant increase in support personnel at the expense of already scarce combat units.

Other inadequate approaches can be garnered from articles written by former Department of Defense officials. Dependence on budgetary constraints (as in the economic model) to improve efficiency certainly cannot be validated by past experience. Prescriptions that "defense budget reductions should focus on the expensive frills and on questionable

¹Procurement of Equipment and Missiles, Army.

"weapons systems" also fall wide of the mark.² Secretary McNamara's statement that major defense decisions pivot on procurement choices may have been true in the Strategic Forces component; but for the General Purpose Forces and the Army in particular, the multiplicity and diversity of equipment make this position logically questionable. In fact, Secretary McNamara's systems analysis approach to many problems proved to be, at best, misleading. For example, asking which tank (or helicopter) should be bought may miss the real problem and lead to improving the wrong strategy and tactical approach.

The limitations of the systems analyst's tool kit must be recognized. The basic limitation has been the assumption of relative "efficiency," when in fact the sheltered military "industry" meets few of the defining characteristics of the competitive firm in economic theory. Furthermore, systems analysis often fails to relate the functioning details of a system to the larger question of its basic purpose. The mathematical conditions of optimization show only that a hilltop has been reached, but cannot distinguish between tops of mounds and mountain summits. Systems analysts have too often relied on brute empiricism, tradeoffs at the margin, and resource inputs, when they should have been looking at the quality of an institution itself before applying their tools. Questioning the system to be analyzed is the *sine qua non* of good systems analysis.³ Such analysis, applied to NATO today, would show clearly that its structure is ill-designed.

NATO currently sustains expensive but weak conventional forces with an emphasis on nuclear weapons. The resulting asymmetry between Warsaw

² As, for instance, in P. Warnke and L. Gelb, "Security or Confrontation: The Case for a Defense Policy," *Foreign Policy*, Winter 1970-71, p. 7.

³ As Charles Hitch states, "What distinguishes the useful and productive analyst is his ability to formulate (or design) the problem: to choose appropriate objectives; to define the relevant, important environments or situations in which to test the alternatives; to judge the reliability of his cost and other data; and finally, and not least, his ingenuity in inventing new systems or alternatives to evaluate." (Emphasis added.) *Decision-Making for Defense*, University of California Press, Berkeley and Los Angeles, 1965, p. 54.

Pact conventional and NATO nuclear superiority has engendered mutual military insecurity and unduly complicated arms control considerations. Moreover, weak but nevertheless expensive conventional forces pose a number of political dilemmas for the Alliance.

Correcting NATO's unsatisfactory structural features would be beneficial on several counts:

1. NATO could design a viable conventional defense at no more than present cost and probably even less.
2. The strategies of Flexible Response and forward defense, which seem the most desirable strategies in the context of nuclear parity, would take on new credibility.
3. The United States could effect sizable military reductions without reducing the most *relevant* military capabilities.
4. Mutual balanced force reduction agreements could be viewed positively as an opportunity both to reduce the Soviet threat and to rationalize NATO's military structure by shedding a number of low-value capabilities, some of which (e.g., Quick Reaction Alert) may appear exceedingly provocative to the Soviets.

Thus, the time is long overdue and especially ripe for a basic re-thinking of NATO's military structure.

Appendix A

A CONTINUED DISCUSSION ON THE HYPOTHESES EXPLAINING NATO'S MILITARY DEFICIENCIES

THE ENTHOVEN HYPOTHESIS OF RELATIVE EQUALITY

This Appendix continues the discussion of the Enthoven hypothesis and specifically focuses on the indicators given in Tables 2 and 3 (pp. 7 and 8), which Enthoven used to justify his contention of relative equality in the European central region.

In Table 2, Enthoven shows that the number of riflemen is roughly equal. But this does not mean that their effectiveness is equal. Infantries differ. The American infantry has been a "rifle" infantry; the Soviet, a "submachine gun" infantry; and the World War II German infantry, a "machine gun" infantry. Throughout the 1950s, the Soviet infantry outgunned its Western counterparts with its well-known AK-47. The Europeans soon closed the qualitative gap. In the American infantry, the semiautomatic M-1 was not replaced by an improved semiautomatic M-14 until the 1962 Berlin crisis; and the automatic M-16 did not replace the M-14 until 1970. In addition, while the WP has long stressed mechanized infantry, which provides armor-protected mobility, immediate small arms resupply, and additional machine guns aboard its carriers, the Western countries were tardy in mechanizing. The United States did not mechanize its European infantry divisions until 1962. It is thus only a recent phenomenon that NATO infantry has gained "output" equivalency in firepower and mobility relative to Soviet infantry--a point further suggesting that NATO may be suffering from a doctrinal lag vis-à-vis the Soviets.

In tanks, the 55-percent figure overstates the Pact advantage, as Enthoven stresses. The Pact tank inventory is predominately composed of T-54 and T-55 tanks, which are generally qualitatively inferior and older than Western tanks.¹ Many of NATO's tanks in the central sector

¹ *How Much Is Enough?*, p. 149. However, a major reason for the older average age of the Pact tank inventory is the converse of its mobilization advantage. As new equipment is procured, the Soviets shift

are also qualitatively superior to the first-line Soviet tank, the T-62.² The major Soviet tank limitation is target accuracy at a range of over 1000 meters.³ However, the Soviet tactic of rushing and swamping defenses in steamroller-style attacks minimizes this disadvantage. With such a style, rugged quantity is more appropriate than the number-limited quality sought by the U.S. Army.⁴

The value of NATO's 30-percent advantage in *Armored Personnel Carriers* (APCs) is unclear. The vehicle's primary purpose is to provide armor-protected mobility for the infantry part of the tank-infantry

the older equipment--whose usability has been enhanced by peacetime training and storage practices to reduce vehicle wear--to low-readiness category divisions. NATO, except for the United States, lacks the reserve structure for absorbing older equipment. Thus, NATO's seemingly qualitative advantage is partly due to its smaller tank inventory.

²The French and Germans still have large numbers of old U.S. M-47 and M-48 90-mm tanks in their inventory. These are being phased out with the 105-mm gun AMX-30 and LEOPARD. The LEOPARD and the 120-mm gun British Chieftain are qualitatively superior to the Soviet T-62. The U.S. M-60, however, is on a qualitative par with the T-62. For an excellent article on tank comparisons, see James H. Polk, "We Need a New Tank," *Army*, Vol. 22, No. 6, June 1972, pp. 8-14. (The AMX-30 also has some excellent features; its difficulty is that its relative lightness has been obtained at the expense of armor protection.)

³Soviet tanks have a large number of other major and minor qualitative defects relative to Western tanks. However, the area in which Soviet tanks greatly excel is in preparation for tactical nuclear warfare. Except for filter systems, the United States and the Europeans have done little to protect their armor from nuclear effects. The Soviets, however, have

1. Designed their tanks with the minimum cross section to reduce dynamic pressure damage (e.g., their T-54, T-55, and T-62 tanks are about a meter lower in silhouette than the U.S. M-60).
2. Provided radiation attenuating liners of lead and plastic for gaseous and neutron shielding (and that secondarily provide some spalling protection).
3. Provided special ventilation systems.
4. Provided their tanks with automatic control units to seal the tank against blast effects and to trigger the special ventilation system.

⁴For a statement of the Army's position of trying to compensate for Soviet numerical superiority by ever greater quality, see J. H. Polk in his keynote address at the 82nd Annual Meeting of the U.S. Armor Convention, *Armor*, July-August 1971, p. 29.

team. The Soviets have enough APCs to mount their infantry. Just because NATO uses a smaller carrier (the U.S. M-113 carries 12 men versus as many as 16 men for the main Soviet carrier, the BTR-60P) and employs more APCs for administrative purposes does not mean NATO should be credited with an advantage. The main advantages of a smaller carrier are a smaller silhouette, greater command flexibility at platoon and company level, and unit integrity of matching a squad with its own carrier. Carrier firepower is at present a secondary consideration.⁵ On the other side of the ledger, smaller carriers mean more drivers, more fuel and maintenance, and a longer closing time in maneuver. In short, until APCs mount larger weapons and become an armored fighting vehicle as well as a troop carrier, no particular advantage is gained by having smaller carriers as long as the infantry is mounted and adequately protected by tanks as in the Soviet tactical system.

Artillery and mortar tubes are shown by Enthoven to be roughly equal in numbers of tubes. This was misleading because it implied equality, when in fact the Soviets had an edge in artillery tubes and more important also had a large indirect fire capability from their multiple rocket launchers, a category that NATO has largely neglected. In any case, equality in tubes no longer exists. When Enthoven first presented his thesis in 1968,⁶ the Soviets were in the process of significantly strengthening their conventional artillery and upgrading the caliber of their mortars. Soviet divisions, though small, now average roughly the same number of artillery tubes as U.S. divisions and more than other NATO divisions. The Soviet division slice in the Group Soviet Forces Germany (GSFG) also has as many tubes (but not army-wide) as the U.S. slice. Because of the large number of Warsaw Pact divisions, it thus appears that the Pact now has considerably more artillery tubes

⁵ Most APCs currently mount a heavy machine gun (12.7 mm). Projected armament for future NATO APCs is only a 20-mm gun. This will probably change because of the new possibilities offered by ATGMs and smooth-bore cannons (the French, for instance, now mount a 90-mm cannon on a 5.8-ton armored car) and as present U.S. and Soviet doctrine shifts to the German view that an APC is more than just an iron truck. The new Soviet APC (BMP-76) already mounts a 76-mm smooth-bore cannon and the Sagger ATGM with a crew of 3 and 8 infantrymen.

⁶ Report of the United States Delegation to the Fourteenth Meeting of Members of Parliament from the North Atlantic Assembly Countries, U.S. Senate, 91st Cong., 1st Sess., pp. 50-59.

than NATO. In mortars, NATO retains an edge in total number of tubes. But in terms of mortar effectiveness, the Pact probably has the advantage because of their shifting to heavy mortars whereas NATO is still using large numbers of light mortars. Thus, while the Soviets have shifted exclusively to the 120-mm mortar, the U.S. inventory, for example, is about equally split between pre-World War II 81-mm light mortars and 4.2-in. (107-mm) heavy mortars.

Enthoven also argues that NATO has considerably more firepower "because of better ammunition, better accuracy of certain weapons, and greater ammunition-expenditure rates because of more logistic capability."⁷ His contention of more effective ammunition is true. As an artillery system, NATO also has greater accuracy and responsiveness because of superior (but expensive) electronic fire-control equipment. Enthoven's contention of greater ammunition expenditure rates, however, requires qualification. Soviet literature and doctrine call for rates of fire 2 to 3 times the NATO rates. Hence, intelligence and military specialists often denigrate the Enthoven conclusion. Yet Enthoven was quite right in noting the Soviets' logistic limitation for resupply. The answer to this seeming paradox is that both sides are partly right. Military specialists often fail to note constraints and credit the enemy with nonexistent capabilities. The Soviets are logically limited overall. But Enthoven misinterpreted the meaning of this limitation by assuming the Soviets would deploy and resupply their artillery as the United States and NATO do.

Even if NATO's overall artillery firepower were greater than the Pact's, its relevance is undercut by the Soviets having a war-fighting style that depends on saturating relatively small sections of the front with fire to support (or to prevent) armored breakthroughs. Thereafter, with NATO's scarcity of reserves, exploiting Soviet armored forces does not require heavy firepower support. Thus, the relevant criteria are not raw firepower across a wide front for a prolonged period, but saturation ability on selected fronts. Here the Soviets have an advantage with their multiple rocket launchers, which

⁷ *How Much Is Enough?*, p. 149.

are considerably cheaper and more effective in saturating areas with fire than tube artillery.⁸

Neglected points in the Enthoven analysis are that Soviet artillery uses longer-tubed gun/howitzers with a range advantage over NATO's shorter-tubed howitzers, and Soviet gun artillery has an antitank capability that low-muzzle velocity howitzer artillery lacks. A point of incidental interest is that prior to the early sixties, Pact tube artillery had significant range and heavier caliber advantages over NATO artillery. This was because NATO's main artillery weapon was then the 105-mm howitzer, which was lighter and shorter-tubed than the Soviets' main 122-mm gun/howitzer. The United States replaced the 105 mm with the 155-mm howitzer in 1962; most NATO countries now rely on the 155 mm, though the transition has not yet been completed and countries such as Britain still rely on the 105 mm as their primary artillery weapon.⁹ With the 155-mm and 8-in. howitzers (versus the Soviets' 122-mm and 152-mm gun/howitzers), NATO now has the advantage in weapon caliber but is still at a slight disadvantage in range for the bulk of the artillery--a disadvantage accentuated by the long 20-km range of the Soviet multiple rocket launchers (the 155-mm and 8-in. howitzer have ranges of 14.6 and 16.8 km, respectively). However, NATO does have an advantage in long-range fire; NATO's 175-mm gun (10 percent of total artillery tubes)

⁸ The Germans also stress multiple rocket launchers. The United States has none because the Army's artillery branch has a predilection for precision weapons, which are more accurate against small point targets (though still an area weapon) and more usable for concentration of fire. The other major objection to multiple rocket launchers is their voracious consumption of ammunition. It is contended that because the rocket launcher is inaccurate, considerable ammunition is wasted. The fallacy in this argument is twofold: The lesser need for pinpoint accuracy for saturation fire and the sporadic requirement for "peak demand" saturation fire limits ammunition demands. Moreover, by satisfying peak demands by high-volume multiple rocket launchers, better utilization is made of more expensive conventional artillery.

⁹ Most analysts attribute the Soviets' upgrading of their conventional artillery in the late sixties to their recognition of the possibility of a limited theater war in Europe. A contributing motivation may also have been Soviet reaction to NATO's upgrading of its artillery with the 155-mm howitzer.

outdistances the Soviet 130-mm gun 32.7 to 27 km, respectively. Finally, no discussion of artillery would be complete without mentioning that NATO's artillery is now largely self-propelled on tracks, whereas Soviet artillery is exclusively towed. This gives NATO's artillery a greater cross-country mobility. But the value of such mobility is also matched, if not offset, by a considerable increase in costs and downtime of tubes.

Divisional logistic lift has little comparative substance because of its differing organizational meaning between NATO and Pact forces. The important measurement is not what is *within* a division, but what is available *in toto* to support a division when required. The Soviets deploy their divisions like drill tips that are to be replaced as they grind down. Only a fraction of the force is deployed simultaneously. One would therefore expect relatively few logistical vehicles in Pact divisions. NATO, on the other hand, feeds its divisions with continual replacements and deploys most of its divisions simultaneously.

Total vehicles is a more meaningful concept when carrying capacity is also indicated. The Pact is definitely weak in this category, especially considering that NATO's military vehicles have a better cross-country capability, generally carry a larger load, and potentially have a much shorter turnaround time by being on the defense. But whereas some would cite the Pact's shortage of logistic carrying capacity as a serious war-fighting deficiency, the evidence may also be interpreted to indicate that the Soviets plan to fight a different type of war than does NATO. The relevant question, therefore, is whether the Soviets' logistic lift is sufficient to meet their expected requirements for a blitzkrieg-style war that is not as logistically demanding as NATO's war-fighting style.

The value of NATO's superiority in *engineers* is unclear. Engineers maintain the lines of communication, provide construction, and clear and prepare barriers. The first two functions are largely dependent on the length of the war, the extent of destruction, and the required transport net needed for resupply. NATO's military engineers are also oriented toward LOC maintenance--functions that can be readily performed by mobilized civil units--and are not specialized for barrier construction

to strengthen defensive positions. Furthermore, because of the Pact's need for a developed road network to facilitate rapid movement and logistical support, NATO's barrier requirements can be focused on the main high-speed attack corridors. These considerations vitiate quantitative comparisons of present forces. Finally, the question has to be asked, Since the attacker has the largest engineer requirement and yet the Soviets are so much weaker in engineer support, what are the Soviets up to? If a NATO-preferred war were fought, insufficient engineers would certainly impair a Soviet advance. But if the Soviets were able to penetrate NATO's front and move rapidly to the Rhine, as their tactical doctrine envisages, they would not need as large an engineer investment.

The airpower comparisons in Table 3 were also used to bolster Enthoven's contention that NATO is conventionally as strong as the Pact. He correctly points out that NATO military spokesmen have traditionally counted aircraft numbers without giving due allowance to the qualitative differences among aircraft. NATO pays a heavy price for its much more sophisticated aircraft. The tactical air share of the U.S. defense budget, for instance, is several-fold larger than the Soviet budget share, and the U.S. defense budget is larger than the Soviets'.

Enthoven suggests from his calculations that NATO air forces have $2\frac{1}{2}$ to 5 times more effectiveness in a ground support role than the Pact's. The Soviet air forces were designed with different criteria than NATO's. While NATO's aircraft are all-purpose aircraft,¹⁰ Soviet

¹⁰ NATO aircraft were designed for mission flexibility, as the result of U.S./British experiences in World War II, which are no longer valid. At that time, when the American/British military had the task of invading land masses, the optimal tactic was to concentrate airpower for the sequential process of obtaining *air superiority* in order to operate in the air without enemy interference; next, *interdiction* in order to isolate the ground battle area; and finally *close air support* for the invading ground forces. In the future, these missions will generally have to be accomplished simultaneously, and a mix of specialized aircraft for an all-purpose capability is more efficient than generalized all-purpose aircraft. Interceptors should not be burdened with the payload, design characteristics, or electronic packages necessary for close support and deep interdiction. For close air support, multipurpose, high-performance aircraft are too costly (in operation and maintenance

tactical aircraft are specialized for air defense and consequently are short-legged and have a limited payload.¹¹

The most serious flaw in the Enthoven analysis is the implied effectiveness of U.S. tactical air on the land battle--a presumption apparently based on World War II experience since the so-called air-ground tradeoff has so far eluded quantification efforts. Yet modern airpower with present ordnance (as assumed by Enthoven) has major limitations. In World War II tactical airpower was extremely effective and perhaps even the critical element supporting U.S. and British ground forces against the Germans. Fighters could make repeated, low-flying passes and expect to survive and to kill personnel and destroy tanks with their machine guns and 20-mm cannons. However, this fact or experience has been invalidated by changes in ground forces--specifically, better armor and the explosive growth in ground air-defense capabilities.

costs and attrition losses) and deliver their ordnance less accurately than slower, more rugged aircraft.

In permissive air defense environments, agreement exists that slower, more rugged aircraft (like the Navy A-1 and even the better World War II fighters) are preferable to modern high-performance jets for close air support. The argument is only inconclusive in the more sophisticated air defense environments, as in Europe. In low-level attacks, slower aircraft are no more vulnerable than jets. While jets use speed to reduce their exposure, slower aircraft have redundant control systems and more armor plating and infrared shielding. Against heat-seeking weapons, high-speed jets currently have an advantage because of the missiles' "catch-up" problem. As missile speeds increase, jets will become disadvantageous because of their more intense "hot-spot" signatures. At higher altitudes against antiaircraft weapons with a larger explosive charge, the two aircraft are equally vulnerable against missiles, but hits are more damaging and hence the tradeoff gives a slight advantage to the reduced exposure time of the high-speed jet. The upshot is that the advantage of high-performance aircraft for close air support is mainly their greater ability to protect themselves against enemy interceptors.

¹¹ Air defense was the purpose of the Soviets' tactical air in World War II and has apparently remained their design criterion. A major implication is that regardless of numbers, Soviet-equipped air forces do not represent a serious offensive threat. The offensive threat is concentrated in their ground forces. Soviet tactical air was a major offensive threat only during a brief period when aircraft were the only means of tactical nuclear delivery. The Soviets now emphasize ground-to-ground missile systems for tactical nuclear delivery. (While we still rely heavily on air delivery, ground-to-ground nuclear missile systems now dominate air delivery in almost every weapons system attribute.)

Many air weapons are no longer effective against the thicker deck armor of modern battle tanks, and "strafing" ordnance has given way to inherently inaccurate dive-bombing attacks with large gravity bombs delivered at high speeds from high altitudes. Even more important has been the effect of air defenses in forcing aircraft into greater stand-off distances. To avoid high attrition, aircraft with dumb ordnance tend to limit themselves to single passes in dive-bombing attacks from high altitude. The quest for survivability has had other adverse effects on tactical airpower: High aircraft speeds limit target acquisition at low levels (except at sea and in the desert); high delivery altitudes require better ceiling and visibility conditions, which often preclude the use of tactical air; and ensuring high performance for attacking aircraft has increased maintenance requirements, which in turn has slowed aircraft turnaround time. Finally, these results have been compounded by the economic infeasibility of fielding large numbers of expensive modern aircraft and the need to divert expensive air assets to supporting missions (flak suppression, ECM, rescue, etc.).

Thus, stated most starkly, some analytical models quite plausibly indicate that tactical air in a predominantly close air support role with present "dumb" ordnance has little effect on the ground battle.¹² In a supply interdiction role with conventional ordnance, tactical air is even less valuable because of time lags, the difficulty of blocking the dense European transport net, and an inability to loiter and destroy enemy transport vehicles in an active air defense environment.

A second flaw in Enthoven's analysis is assuming that so many of NATO's aircraft could be assigned to the ground mission. In fact, a large share of NATO's air forces are still fully committed to a dated Quick Reaction Alert nuclear role, and only a fraction of the remainder are available for ground support because of the demands of air cover and other missions to support the attacking aircraft. Thus, although NATO may have a greater payload potential from its multipurpose aircraft, the actual advantage is much smaller.

¹²The kill probabilities of "smart" bombs are 100 times or so greater than those of dumb bombs depending on the radius of kill and relative CEPs. Smart bombs would restore some of the former effectiveness of tactical air. However, the United States has so far been reluctant to share the sophisticated technology of smart ordnance even

Finally, a number of problems derive from the sophistication of NATO aircraft. Foremost is that such aircraft require larger and more complex (i.e., fewer) bases to service the aircraft efficiently. This obviously increases the vulnerability of the aircraft weapons system, which Enthoven's advocated program of aircraft shelters cannot fully offset. Second, sophistication increases the maintenance requirement--hence, reducing aircraft turnaround time and its derived sortie rate. The Pact's sortie rate is hence potentially greater than NATO's. Enthoven implies the opposite conclusion from the fact that the Soviets fly less in peacetime than does NATO. According to this reasoning, the Soviets can expand their flying hours only by about the same percentage amount as does NATO. This reasoning neglects the Soviet practice of minimizing peacetime operations and maintenance costs by equipment storage and correspondingly revised training techniques. In a short war when the aircraft's useful life span is a function of raw time (e.g., due to overrun/destroyed bases) rather than attrition rate times sorties flown, the measure of effectiveness has to include sortie generation potential *within finite time spans*. Consequently, Enthoven's timeless payload and loiter-time indicators, which were based on comparisons of aircraft numbers and characteristics, have to be reduced to reflect the Pact's inherently greater sortie rate.

In short, further analysis seriously qualifies Enthoven's contention that "NATO has a significant advantage" in airpower and "adds to the confidence that NATO's land forces could be made effective enough

with its NATO allies. Moreover, symmetrical use of smart ordnance would work to the Soviets' numerical advantage in aircraft by reducing NATO's relative advantage in "trucking" capacity. Accuracy means smaller warheads are necessary to kill point targets, and hence there is a potential ability to carry more weapons. Unfortunately, this is more of an advantage for the small-load Soviet aircraft than for NATO's large-load workhorses, because ordnance air resistance and a limited number of so-called aircraft hard points inhibit slinging a full payload of smart ordnance. The pilots themselves also have a physical limitation as to the number of passes per sortie they can make in a sophisticated, high-attrition air defense environment.

For armored warfare, the Maverick antitank missile is the important innovation. Without smart ordnance, close air support is a relatively unattractive use of tactical airpower. With new ordnance, tactical air appears somewhat more cost effective in attriting (but not stopping or holding) enemy armor than the current U.S. armored division.

to contain the Pact forces in a conventional conflict" by "providing all the 'horseshoe nails' needed to realize the full potential of NATO's existing conventional forces."¹³

In summary, throughout his comparisons, Enthoven presumes that the Soviets fight as we do and that NATO's military structure and procedures are fundamentally sound.¹⁴ Consequently, his static comparisons of relative force components cannot be interpreted without first answering the following questions:

1. Which war-fighting styles are the more appropriate under what range of circumstances?
2. How do various combinations of forces affect the different combat styles?
3. Do the Soviets have sufficient forces to implement their style of warfare?

Enthoven's comparisons are based on the analogy of economic inputs,¹⁵ but when the "production processes" are not identical, as in the case at hand, inputs are not a reliable guide to relative efficacy, as repeatedly shown in military history.

THE ALLIANCE POLITICS HYPOTHESIS

The thesis that alliance politics rule out a consistent and rational military logic has been used to explain NATO's conventional deficiencies. These explanations can be broken down under the following four headings:

1. The need for consensus among member nations and within the Alliance's civil-military bureaucracy makes adaptive changes and innovative activity difficult.

¹³ *How Much is Enough?*, pp. 154-156.

¹⁴ *Ibid.*, p. 138.

¹⁵ As a sidelight to indicate the difficulty of using input indicators as proxies for effectiveness, the Enthoven effectiveness index for aircraft of payload, loiter time, and crew training can be maximized by using airline Boeing 747s.

- 7
2. Political considerations prevent a rational division of labor.
 3. Alliance politics hinder the development of joint projects and their derived economies of scale (e.g., in Research and Development).
 4. Alliance politics preclude the best distribution of NATO's forces among the central and flank regions.

Proposition 1 reflects the frustrated American effort to increase the Western European contribution to NATO forces and budgetary levels. It took years of American pressuring, commencing in the early Kennedy administration, to gain formal NATO acceptance of a new Flexible Response strategy. Though the resistance to adaptive change is all too real, one should not confuse policy coordination *among* allies with decisionmaking problems *internal* to each of the national military entities. The NATO bureaucracy, for instance, wields operational control but not command authority over assigned national forces. This means that the NATO bureaucracy monitors the strength and readiness of the national forces; it does not shape their organizational design and tactical doctrines. Member countries are free to design their forces as they see fit. This makes adaptation to change easier than most critics contend, for the process can begin with a single country rather than in unison. For example, the United States was not constrained by the need for Alliance consent in reorganizing its NATO-committed forces in 1957 (PENTOMIC) and 1962 (ROAD). Neither did the FRG need prior Alliance consent for its ongoing restructuring of its ground forces.

Complaints concerning NATO's division of labor (Proposition 2) reflect U.S. unhappiness with European reluctance to embrace the American penchant for economic efficiency. Efficiency could be obtained if each country would concentrate on the military component in which it holds a comparative advantage. The implied recommendation is that the United States should provide the most sophisticated components, such as nuclear weapons and airpower, while other countries provide labor-intensive forces, such as high-casualty infantry. Although this policy is theoretically efficient, it would be politically unacceptable,

economically infeasible in practice,¹⁶ and militarily undesirable. No government, except under the threat of national survival, would tolerate the role of acting as cannon fodder for another. Militarily, complete division of labor would be risky and unworkable. A military organization functions as a team; the various components must work together smoothly. If these components were to be provided by different nations, coordination would be well-nigh impossible and the withdrawal of a single country would cripple the alliance during a crisis.

Proposition 3 suggests a less drastic economic theme involving multinational development and procurement programs, which have not been auspicious successes. The underlying problem is that although countries may agree on broad strategic and tactical approaches, each national military establishment retains its own idiosyncracies. One example, among many, is the Germans' attitudes on tank design, which reflect their experience on the Russian Front in World War II and thus differ from the U.S./British view. The Germans prefer a low-silhouette, fast tank; the U.S./British, a more heavily armored tank. In short, much of what appears to be "political" rivalry in joint programs is often due to divergent military preferences.

¹⁶ As a theoretical proposition from economic theory, the division of labor thesis is designed to shift resources among countries so that more force can be bought for the same total expenditure. If there were no constraints on international capital flows and trade, great potential would derive from the United States specializing in its areas of absolute advantage in high technology (e.g., nuclear weapon systems) and from the Europeans providing most of the manpower. As a rough indicator of this potential, the U.S. Army costs as much as the entire military establishment of the European allies, yet has only one-third the manpower strength of these forces. If capital flows are inadequate because of the so-called transfer problem of international trade, the potential savings are substantially reduced: The United States could then only partly cut back its forces by "buying" cheaper foreign forces (financed by exports where the United States has a comparative trade advantage). Nevertheless, some gains are still possible from partial specialization; for example, the United States could buy more aerospace forces and cut back its ground forces, while the Europeans could buy more ground forces and cut back their air forces.

Another aspect of the division of labor thesis is the potential of complete specialization for obtaining economies of scale from eliminating national overheads. However, while such specialization would permit some economies, it is partially offset by the pyramided command structure of a larger military entity.

Finally, if joint projects are to effect significant savings, they must be applicable to a wide range of technologies and procurement programs. Joint projects, however, generally presume technological complexity. Yet it is increasingly clear that many weapons have become unnecessarily complex because of questionable military specifications and multipurpose design requirements that cause an expensive pushing of the state of the art. If these questionable practices were corrected, R&D would be less expensive, and greater production runs brought about by reduced unit costs would concurrently often bring economies of scale; more projects could therefore be afforded on a national scale. Thus, although there are projects that should be jointly supported, some that would seemingly justify such support are due to misspecification of military requirements.

Proposition 4--concerning the disposition of allied divisions-- has had a measurable impact on NATO's military capability. Alliance politics, in conjunction with European geography, have maldistributed NATO's forces. Within Europe, the WP has the military advantage of interior lines of communication that facilitate shifting and concentrating Pact forces among the three major areas of center and flanks. NATO forces, on the other hand, are vulnerable to piecemeal defeat as a result of their wide dispersal on a coastal littoral. Since each NATO region naturally tends to visualize the enemy's strength as focused on itself, each is reluctant to allocate forces to other regions. In particular, the southern flank countries that have a surplus of ground forces are unwilling to reassign their troops into the center region.¹⁷ Moreover, to cement the Alliance, the United States (and to a lesser extent Britain) maintains naval and special air and army units in the southern flank. Only 28 percent of NATO's divisions (including 5 French) are located in the critical center region, with another

¹⁷ Greece and Turkey have $30\frac{1}{3}$ mobilizable divisions and a peace-time strength of 538,000. Italy has $10\frac{2}{3}$ division equivalents whose main military function is guarding the mountain passes leading from Yugoslavia and Austria into Italy. Forty-two percent of NATO's divisional strength (833,000 army strength) is thus committed to the southern flank, as opposed to about 20 percent of the WP's nominal division strength (450,000 to 500,000 army strength) in Hungary, Rumania, Bulgaria, and the USSR areas contiguous to Turkey. ISS, *The Military Balance*, op. cit.

6 to 9 percent of division strength readily available as reinforcements from France, Britain, and the United States.¹⁸ Thus, only about 35 percent of NATO's divisional strength is readily available for the central front as opposed to about 50 percent for the Warsaw Pact.¹⁹

In summary, the alliance politics thesis is helpful in emphasizing that NATO's military effectiveness is constrained by the difficulties inherent in any working partnership of no less than 15 sovereign states. But what has not been appreciated is that many of these constraints are engendered by NATO's lack of conventional parity with the WP. This causal relationship has not been carefully investigated because of the almost universal assumption that NATO cannot possibly match the strength of the Warsaw Pact ground forces without massive additional expenditures. Preferred solutions to NATO's conventional inferiority--derived from economic efficiency considerations--would at best release marginal resources to buy more of NATO's misstructured forces. Moreover, because of U.S. military preeminence, in some cases these prescriptions would have led to incorrect solutions by suggesting universal adoption of an inappropriate American military model. Even redistribution of strength from the flanks to the all-important center region of NATO would only partially resolve the disparity between the opposing ground forces by permitting at most the replacement of a German corps by Italian troops in Bavaria for duty in North Germany. In short, the alliance politics thesis does not offer solutions of enough scope to resolve NATO's conventional disparity, except under unrealistically utopian conditions.

¹⁸ In addition, the United States and France have a large number of mobilizable reserve divisions and division equivalents, but these are not available for deployment in Germany. French units are largely infantry battalions for defense of the home territory. United States reserve units are slow to deploy, and too many are infantry units unsuitable for European deployment. Regular and air-portable infantry lack the firepower, armor shielding, and *tactical* mobility necessary for combat on the Continent, except for specialized tasks. See also footnote 3, p. 26.

¹⁹ Of the remainder, almost 20 percent is tied down on the Sino-Soviet border, 20 percent is on NATO's southern flank, almost 10 percent is in the deep interior of the USSR and not readily available for any theater, and several percent are on the northern flank.

Appendix B

THE AMERICAN AND EUROPEAN STRATEGIC DIVERGENCE:
THE VIEW FROM EUROPE

Deterrence is NATO's linchpin; but what if deterrence should fail? That is, if the Warsaw Pact were to strike out aggressively, how should the Western allies respond?

The European answer to this question characteristically differs from the American, because Europeans are acutely sensitive to the physical consequences of conventional war. Our allies believe that any war with the USSR will be potentially crippling to their Western European homelands, whereas only a strategic nuclear interchange would be disastrous--and hence deterring--to the Soviets. The Europeans, therefore, prefer a declared strategy of irrevocable escalation to nuclear warfare. From the U.S. viewpoint, such a policy appears foolhardy and irrational. Thus, in contemplating alternative actions, should deterrence fail, the NATO partners advocate opposite next steps: The Europeans would downplay conventional defense and emphasize rapid escalation to strategic warfare; the Americans would emphasize conventional defense and downplay escalation.

Under the old "trip wire" strategy, the Europeans perceived themselves as enjoying the best of all worlds--a high probability of deterrence and assured nuclear coupling through U.S. strategic superiority, modest conventional military outlays, and a high probability of remaining relatively unscathed from a one-sided strategic nuclear war. Until the late fifties the Soviets had few nuclear weapons and would have had little incentive to use them for countervalue targets in Western Europe. Since it appeared Soviet ground forces could readily overrun and occupy the Continent, the few weapons available to the Soviets would have been better utilized against military targets to facilitate their advance, or, in case of failure, withheld to threaten European cities. Moreover, if escalation had occurred rapidly, the Europeans would most likely have been spared enemy occupation because of the Soviets' inability to sustain and reinforce their armored spearheads (i.e., the so-called broken-back thesis).

As long as the Soviets were strategically weak, the trip wire strategy was also attractive for the United States. But the Soviet strategic buildup, combined with NATO's conventional inferiority, placed an impossibly high burden of risk on the United States. The shift in the nuclear balance inevitably eroded faith in U.S. nuclear reliability. From the U.S. viewpoint, the trip wire strategy had to be changed to reflect the new nuclear realities.

Thus, in 1967 NATO formally adopted the Flexible Response strategy under pressure from the United States. However, the European countries, reluctant to accept the changed conditions, have for the most part only verbally concurred with U.S. demands for greater conventional capabilities while relying in substance on the old trip wire strategy. In fact, they have been slow to realize that the Soviet nuclear buildup now implies two bleak futures for Western Europe should a strategic nuclear war occur: either Soviet military occupation and postwar economic exploitation to rebuild the Soviet Union or, should Soviet ground forces fail to occupy Western Europe, the likelihood of destruction by Soviet nuclear weapons to foreclose a relatively undamaged Europe (possibly led by the Germans) from filling any new power vacuum.

The Europeans object to strengthening NATO's conventional defense because they perceive a number of disadvantages to themselves in such a policy. Most serious, comparable conventional forces appear to be infeasible without very large peacetime budgetary outlays. The Europeans also feel that the increased expenditures continually urged by the United States would undermine their preferred emphasis on declaratory deterrence. They fear that if larger but still inadequate conventional forces are available during a crisis, the exercise of strategic options may be delayed and limit the conflict to European territory--thereby weakening the credibility of deterrence.¹ Finally,

¹Most European objections to reduced U.S. force levels in Europe rest primarily on the fear that such reductions would tend politically to degrade U.S. strategic guarantees. (Paradoxically, fear of the same result has in the past persuaded Europeans to oppose high conventional force levels.) In addition, Europeans fear a situation in which, of military necessity, they would be driven to increase their own defense budgets and, given resource and geographic realities, countenance

Europeans associate conventional defense either with World War II levels of destruction or, given NATO's conventional weaknesses, with leading to highly destructive tactical nuclear warfare in their territory.

One of the flaws in the Europeans' viewpoint is their catastrophic vision of the destruction that would be wrought by conventional warfare. A short conventional conflict in Europe, regardless of its intensity for the combating forces, would be minimally destructive to the civil populace and economic base. World War II was devastating because of its duration, the need to destroy the enemy's war-making industrial capacity, the extensive high-explosive bomber and artillery weapon systems employed, and the scorched earth tactics pursued by retreating belligerents.² None of these conditions would exist for a short war. Destroying European industrial capacity in urban areas would make little sense in a short conventional war. The Soviets would have no incentive to do so if they were winning, and they would be reluctant to divert their limited conventional means to that end if they were losing. Military forces are now small by World War II standards. Only the United States has a large air delivery capability,³ and only the United States

an increase in German influence within NATO. Although there is bound to be some political or psychological penalty attached to any withdrawal of U.S. military personnel from Europe, reductions consonant with maintained or increased combat capability would minimize these penalties. The Germans seem to sense this; they have privately become quite critical of what they consider the imbalance between capabilities and size of the U.S. posture in Germany. Thus, considering the relief in offset payments that reductions could involve for Germany, the net political effect could well be positive.

² Scorched earth tactics by retreating NATO forces would not be particularly useful in a short war and in the spatial shallowness of Western Europe. Moreover, such tactics are unnecessary if NATO organizes for a strong initial defense that could contain Soviet penetrations. Under these conditions, scorched earth destruction by retreating Soviet troops would be limited to only the forward parts of the FRG, though Eastern Europe might be severely damaged from a Soviet withdrawal.

³ The Soviets do not have a large "trucking" (range times payload) capability. Their tactical aircraft were designed for air defense; the bulk of these fighters in a short-range (100-mi) configuration have a payload of only one or two 550-lb bombs. The remainder of the Pact's fighters--about 1000 SU-7 Fitters and MIG-21J and K Fishbeds--can carry two 550-lb bombs 300 to 500 mi in a high-low-high penetration mode. (An F-4 by comparison can carry about 6000 lb for a similar distance.) The Pact also has about 1300 bombers, including maritime and strategic Long-Range Air Force.

has the logistical resupply for employing massive firepower. Formerly, the Soviets also maintained large numbers of supporting artillery divisions; but these numbers have been sharply reduced (some, of course, being replaced by nuclear missile systems). Finally, because longer-range air and missile delivery systems have become too expensive to employ extensively on nonmilitary targets without tactical nuclear warheads, the depth of most of the collateral damage in a conventional war would be more or less limited to the area enclosed by a trace of the movement generated by battle lines (plus about 20 km for the range of conventional artillery).

The key flaw in the Europeans' perceptions, however, is their cost assumptions. With appropriate restructuring (as argued in detail in Secs. V to VII), NATO could buy a viable conventional defense for about present costs or less. Indeed, a viable conventional defense (as opposed to a larger but still inadequate one based on present procedures) would strengthen declaratory deterrence, because NATO's credibility problem has been caused by conventional inferiority in an overall context of strategic superiority. With the conventional deficiency corrected, there would be no military asymmetry to tempt the Soviets even in the context of nuclear parity.

With a viable, short war conventional defense, the Europeans would also desire to delay the exercise of tactical nuclear options. Raising the tactical nuclear threshold would thereby reduce the possibility of inadvertent nuclear war and, because NATO could fight conventionally without resort to nuclear weapons, this would dampen the Soviet incentive for a preemptive nuclear strike. A conventional option would thus be unambiguously advantageous for Europe. Once our allies are persuaded of this, it seems probable that the European preference for a declaratory strategy of "irrevocable escalation" could then be modified to

"irrevocable escalation only after the tactical nuclear threshold is crossed."⁴

⁴One purpose of the French and British nuclear forces is to increase the credibility of NATO's declaratory strategy, partly by reducing the possibility of superpower collusion to limit any conflict to Western Europe, and partly from reducing the value of any Soviet blackmail attempt on the United States. Seen from this viewpoint, a European nuclear force has much to recommend it now that the Soviets have strategic parity with the United States. The adverse side, however, is that with the Europeans' view of conventional defense as hopeless, they might structure themselves for a hair-trigger response to a Soviet conventional attack. Posturing for such a response can be destabilizing and can lead to an inadvertent nuclear conflict. There are already some indications that the French may adopt such a structure when their Pluton tactical nuclear missile is deployed in 1975. They are considering the possibility of reorganizing into armored cavalry divisions to protect the Pluton and to acquire targets for it. The French would thus explicitly signal that they are forfeiting a conventional war-fighting option and have no choice but the early initiation of tactical nuclear weapons.

Appendix C

FLEXIBLE RESPONSE FROM A SOVIET PERSPECTIVE: WILL THE SOVIETS
AGREE TO MUTUAL RESTRAINT?

The distinguishing feature of Flexible Response--compared with more traditional military strategies--is its dependence on mutual military restraint. Given Soviet ground superiority, the concept of limiting the automaticity of nuclear warfare should seem attractive to the Soviets. Yet they have not viewed graduated escalation favorably and are not likely to do so without changes in their strategic posture, if then. Strange as it seems to American analysts, there are solid reasons (discussed below) for the Soviet reluctance to abide by the tenets of graduated response.

Until recently, Soviet doctrinal literature has not acknowledged the possibility of limited war in Europe. The Soviets have viewed any future European conflict in the context of a general nuclear war. While NATO has feared Soviet conventional power, the Soviets have feared American nuclear power even more. Hence, the Soviet position has been similar to that of the Europeans: Deterrence is strengthened by the fear of irrevocable escalation. Such a position, of course, is consistent with a weaker nuclear power's strengthening its deterrence by a declaratory policy of attacking *countervalue* rather than *counterforce* targets.

More recently, the Soviets have indicated that theater conventional wars (without specification of which theater) might indeed occur. Many analysts have attributed this to a doctrinal time lag resulting from Soviet military theory catching up with Western thought. But it should also be noted that Soviet acceptance of theater conventional wars coincided with the possibility of a Sino-Soviet conflict. In such a clash, the Soviets would naturally prefer to limit the use of nuclear weapons, in particular strategic weapons, because the Soviets could overrun North China and Manchuria very rapidly and thereby obtain limited objectives (see below) at minimum risks to themselves through the medium of conventional warfare.¹

¹In the open terrain of North China, Soviet mechanized forces can easily defeat the Chinese infantry, as exemplified by the debacle of

In Europe the situation (and Soviet attitudes toward the situation) may be different. The Soviets would probably be unlikely to accept a theater conventional war for more than a period of several weeks. The reasoning behind this theory is somewhat complex. Essentially, the argument is that the Soviets, being more aware of their own economic and strategic weaknesses, most likely see U.S. and NATO espousal of Flexible Response as a devious Western trick. First, as Marshal Sokolovskii points out, a limited war presumes limited political objectives.² Since a Soviet invasion of NATO would by definition entail more than limited objectives to all parties involved (e.g., the French), the Soviets see limited war in Europe as a contradiction in terms (whereas this may not be so in the Chinese case because the Soviet objective would most likely be advertised as the limited goal of replacing an aberrant Communist regime in accordance with the Brezhnev doctrine). Consequently, given the Marxist-Leninist principle (derived from Clausewitz) that the military mission is but a tool of the political, it seems reasonable to accept Soviet statements at face value: Limiting a conventional war in Europe does not appear politically feasible.

A second Soviet argument against a prolonged conventional war with NATO is NATO's acknowledged economic superiority. Sokolovskii, for instance, by drawing on Lenin and Engels, emphasizes that modern military power is derived from a nation's economic status. For nuclear war, this can be interpreted as sophisticated technology; for traditional war, the industrial ability to turn out massive amounts of war material. Sokolovskii also stresses that a U.S. World War II and cold war strategy has been the economic exhaustion of U.S. opponents. This scientific law of economic prowess would not apply to a short conventional war involving only peacetime forces-in-being and forces-ready-mobilizable, but it would be a binding constraint in a prolonged conventional war. Hence,

the elite Japanese Kwantung Army in 1945. Subduing China could well be a difficult task, but this is not necessary if the objective is seizing high-value centers, such as Peking, for bargaining purposes or for installing another Communist regime.

²V. D. Sokolovskii, *Military Strategy*, 3rd ed., Foreign Technology Division, Department of the Air Force, 1968, p. 66.

it is very likely that the Soviets see Flexible Response as a trick to induce them into into a posture for a conventional conflict that might become prolonged to the United States' advantage.

The third argument of the Soviets against the Western version of Flexible Response is the military advantage they would hope to gain by ensuring that any ground conflict would be short. A high-intensity short war and tactical nuclear firepower circumvent much of the need for artillery and logistical systems that are required for breakthroughs in a short war (if the enemy is strong) and staying power in a long war. Given the overall Soviet resource disadvantage vis-à-vis NATO, short-circuiting the normal requirement for logistical and artillery units provides the Soviets with a higher percentage of combat maneuver units to total strength, which offsets Western resource superiority. The Soviets have thus traded off a long-run protracted war option (which is unattractive anyway) for an initial and highly visible combat capability, which has served as a deterrent against NATO and which could probably overwhelm an unprepared NATO even without nuclear weapons. Moreover, a high-intensity posture opens the possibility of using a short conventional pause to destroy opposing tactical nuclear systems and to obtain a relative advantage in tactical nuclear weapons. NATO is vulnerable to this tactic because of its emphasis on aircraft and tube delivery of tactical nuclear warheads.

A fourth corollary of Soviet thinking is the inadvertent nuclear war argument. If a conventional war is considered infeasible because of the enemy's known weakness and his stated intention to escalate rapidly to the nuclear level, one might as well plan to strike first to obtain (1) the savings from eliminating unnecessary artillery and logistical systems from the force structure;³ and (2) the military benefits of preemption, particularly if the opponent is dependent on highly vulnerable tactical nuclear systems such as NATO's Quick Reaction Alert aircraft and short-range artillery gun systems. Such systems have the

³ An interesting feature of the Soviets' force disposition is that almost all their larger signal, engineer, and transport regiments are concentrated in the GSFG and Western USSR, but only about half of their nondivisional artillery. Soviet tanks are also better prepared for tactical nuclear warfare than NATO's, as discussed in footnote 3, p. 62.

attributes of a vulnerable first-strike nuclear force, and preemption would give the Soviets a considerable military advantage.

A fifth consideration shaping Soviet conventional options in Europe and enhancing Soviet interest in a short campaign lies in conditions that are likely to prevail at the strategic nuclear level. One must assume, of course, that a U.S. force posture and strategic arms control policy will succeed in denying the Soviets all-out, damage-limiting strategic superiority that would allow them to launch a strategic first strike with impunity. In the absence of such superiority, while pursuing limited objectives in the European theater, the Soviets can be assumed to prefer that hostilities not escalate to the strategic level.

Given a general aversion to escalation above the theater level, the Soviets would have a basic inclination to seize their local objectives, conclude their campaign, and terminate hostilities as soon as possible. Any Soviet offensive against Western Europe, however short the time it might take to succeed, would constitute the most urgent strategic warning for the United States. As a consequence, the United States would certainly generate significant portions of its nonalert strategic forces (i.e., bombers and SSBNs), presenting to the USSR a much more formidable opponent than in normal peacetime. Moreover, U.S. leaders would become more willing to consider launching Minuteman ICBMs on warning of a large Soviet strategic attack. These conditions would degrade Soviet capabilities for a sudden first strike, possibly generate the image of a first-strike capability on the U.S. side, and increase Soviet fears of instability and risks of strategic nuclear escalation. Beyond this, protracted hostilities in Europe would probably encourage the direct, if limited, engagement of strategic forces in a two-sided attrition campaign, notably at sea where SSBNs (as well as attack carriers⁴) could be engaged without national territory being infringed. In the near future, say, through 1975, SSBN and ASW force size and quality, together with geographic asymmetries (U.S. forward bases for SSBNs

⁴ Against carriers, the Soviets must consider (1) the sea-denial design of their surface fleet that limits them to a "one-shot" attack before they themselves are destroyed by airpower, (2) the carrier's ability to absorb and recuperate from hits with conventional warheads, and (3) their own vulnerability to strategic attacks by carrier aircraft. These considerations work against a conventional pause and in favor of an early, if not initial, use of tactical nuclear weapons.

and the Soviet need to deploy close to U.S. shores through vulnerable routes) would give the United States a marked advantage in an attrition campaign at sea.⁵ Such a condition would be perilous for the Soviets, particularly if their land-based systems were to become simultaneously vulnerable from technological breakthroughs.⁶

As the Soviet SSBN and ASW force grows in size, quality, and range (i.e., deploys a longer-range SLBM), the war-at-sea relationship could become more evenly matched. If at the same time the United States allows the Soviets to field severe threats to the survival of its land-based missiles and bombers as well, the Soviets might come to perceive a positive value in protracted strategic crisis with active attrition. Such a situation--so perilous for the United States that one must assume it will be foreclosed by U.S. force posture decisions--might well reduce Soviet interest in an early termination of hostilities in Europe. But it would not necessarily reduce the Soviets' determination to seize local objectives and to conclude local offensive operations in the shortest possible time. Quite the contrary, if time and the force attrition it allowed at the strategic level were to run to Soviet advantage,

⁵ As long as this condition exists, a war-at-sea sanctuary is disadvantageous for NATO. A moratorium on attacking sea-based strategic forces during a conventional conflict would be stabilizing in the *ex post* sense of increasing mutual survivability of sea-based strategic delivery systems. *Ex ante*, however, a war-at-sea sanctuary is destabilizing as long as NATO lacks conventional comparability, because the Soviets could then contemplate additional time to consolidate their gains before the attrition of their increasingly important sea deterrence force became critical.

NATO and the United States gain from a war-at-sea sanctuary through earlier use of the sea lanes. In a short war, however, use of the sea lanes is relatively unimportant to NATO. For a longer war, the value of the sea sanctuary is clouded by the uncertainty of abrogation. Without a sanctuary, NATO's ASW forces would be slowly clearing the sea of submarines while few ships were plying the sea lanes because of the time lags required for mobilization and the shift from commercial to war shipping. Abrogation of the sanctuary by the Soviets at, say, D + 60 days could disrupt this sequential process and require ASW forces to clear at a time when shipping was more necessary because of reduced stockpiles.

⁶ See, for example, "Pentagon Confirms Shift in Missile Development," in which DOD acknowledges plans for pursuing the development of more powerful and more accurate missile warheads capable of destroying a secure (i.e., hard point) military target in the Soviet Union. *New York Times*, August 10, 1972.

a quick victory leading to a military *fait accompli* would increase U.S. willingness to formalize a concessionary peace before the U.S. retaliatory force was seriously degraded.⁷

Other than reemphasizing the Soviet incentive for a short war, two other implications arise from considering the interface of conventional with strategic warfare. The present vulnerabilities of Soviet SLBMs mean that if they are deployed on a wartime basis, the Soviets must pass their Yankees through the Western ASW gauntlets in peacetime. This provides NATO some measure of early warning and inhibits a Soviet "out of the blue" attack in Europe. Second, as long as time works against the Soviets in the strategic equation, the Soviets must orchestrate military and negotiating strategies to ensure early termination of hostilities.

Thus, major reasons exist why a strategy of Flexible Response would not appeal to the Soviets. A conventional war lasting longer than 30 to 60 days is not attractive to the Soviets, and they may well be contemplating an even shorter war by early use of tactical nuclear weapons.

⁷The present U.S. long war posture in such a context would amount to a contradiction in terms.

Appendix D

THE SOVIET AND PACT THREAT: AN OPERATIONAL ANALYSIS

NATO has always deceived itself as to Soviet and Pact strength and capabilities. The USSR was initially credited with 175 in-being divisions. Today the Soviets are credited with 161 divisions and their client states with 60 (see Table 1, p. 5). In retrospect, the number of divisions the USSR was alleged to be able to support and project into Western Europe was inconsistent with the state of its postwar economy and the Soviet leadership's desire for rapid reconstruction and economic growth. These constraints are no longer so binding, but it remains true that the Soviets' current ability to support and project their forces is less massive than it appears.

A look at Soviet forces in Germany indicates that their adjusted peacetime division slice is only 19,000, versus 42,000 for the United States and 25,000 to 31,000 for the FRG/UK/Fr (see p. 17). While these comparisons raise serious questions about the efficiency of the U.S. posture, an equally important question is, For what purpose have the Russians designed their force structure? Their military posture of maximum force visibility is consistent with the following missions: deterrence, intimidation and smothering of political opposition within the Eastern countries by massive intervention with line combat units, a tactical nuclear war, and a short war in Western Europe against moderate resistance. The Soviets' posture is not consistent with an offensive conventional fighting mission, which would require heavy fighting and extensive exercising of their logistical system over a prolonged period. Some would argue that the Czechoslovakian invasion proves otherwise. But the invasion showed only that the Soviets, after extensive preparation and the call-up of reserves, could coordinate a large administrative road march to Prague using surprise techniques. This is considerably different from exercising a logistical support system while fighting against a respectable opponent.

The Soviet military is notable for the high visibility of its divisions and the scarcity of its logistical support. High visibility is

obtained in four ways: (1) buying combat strength at the expense of logistical support, (2) integrating much of their training and schooling into their operational structure (see footnote 4, p. 54), (3) organizing into smaller units than similarly termed Western counterparts at all levels, and (4) maintaining skeleton cadre divisions in the active force. These deductions can be readily noticed in the aggregate by simply dividing total strength by total divisions: The United States has 71,000 men per peacetime division slice; the FRG, 27,000; and the Soviets, 11,000. That the Soviets do not buy much logistics to support their divisions is apparent from statistics, which show that even their best-manned divisional force (the GSFG) has an adjusted in-theater divisional wartime slice of only 21,000 compared with over 41,000 for the NATO countries and 48,000 for the United States.

MOBILIZATION AND REINFORCEMENT

The 161 Soviet divisions represent widely different states of wartime availability, which can be roughly measured in terms of unit strength and equipment levels. Some, such as the GSFG, are kept at near full strength; others, as low as 10 percent. The common and key element is the cadre skeleton, which provides a command structure and a functioning team that can be rapidly fleshed out upon mobilization. Equipment on hand is also largely stored to reduce maintenance, to maximize equipment readiness, and to minimize wear and tear.¹ These features are crucial in the Soviet military system not only because of the lean logistic system but also so that older equipment can still be used for lower-readiness Soviet divisions and most client divisions.

Pact war planning calls for a rapid mobilization of a large number of divisions, which would become operationally ready at staggered intervals according to their peacetime manning levels. Staggered readiness

¹ U. S. Army FM 100-10, *Combat Service Support*, Department of the Army, October 1968, p. 10-1, states: "Proper maintenance of equipment increases its period of economical usefulness, reduces supply requirements and conserves resources for other purposes." Thus while the U.S. Army stresses maintenance to obtain these three objectives, the Soviet Army stresses other means of training so equipment does not have to be used.

meshes with the Soviets' style of fighting and the limitations imposed by their transportation system. In the offense, Soviet military doctrine calls for maximum shock and impact on defending NATO forces in order to penetrate and move rapidly into the rear of forward-defending units. The Soviets accept the inevitability that, for the sake of time and other advantages, many of their attacking units will be decimated. The large but staggered number of mobilized divisions are to serve as replacement divisions so that the momentum of the attack can be maintained.² By concentrating their efforts along penetration fronts and by rapidly replacing (or passing through) worn-down units, the Soviets would hope to eliminate the immediate need for a large number of combat support and service support units. Because only a fraction of the large number of divisions is to be fighting at one time, the Soviets have logically pooled supporting units and have been very stringent in allocating support to divisional units.

The weak link in the Pact mobilization scheme is the movement to distant deployment areas. The transport net within the USSR to all likely deployment areas is sparse, requiring a staggered movement that is generally consistent with the readiness schedule of the skeleton divisions. The real limitation is transporting Soviet tanks and other tracked equipment. Soviet tanks are constrained to use vulnerable rail lines to reduce maintenance and wearing down of equipment. Tanks cannot be moved on their own power to any of the NATO fronts without on-site major repairs before deployment. This would be true for all armies, but the Soviets have a particular problem of quality control in manufacturing (and older tanks in skeleton units). Moreover, the Soviets

²This tactic takes advantage of a NATO weakness and offsets a Soviet weakness. The Soviets now train extensively at night in order to be able to fight what is called the continuous 24-hour battle, in which their units keep up an incessant round-the-clock pressure against the enemy--the object being to exhaust NATO's units physically while theirs are replaced and the process repeated. (B. Perrett, *Fighting Vehicles of the Red Army*, Arco Publishing Co., New York, 1969.) By maintaining their momentum with large numbers of combat units, the Soviets are able to saturate the enemy with combat power and offset the need for flexibility and initiative at the company-grade level. Thus, the Soviets' relative inferiority in command flexibility and initiative may be less important than some analysts assert.

do not have the repair units; nor would time be available. This constraint could be removed by prepositioning of tanks or buying large numbers of tank transporters--as the Soviets now seem to be doing--for carrying tanks between the USSR and the theaters.

OPERATING WITHIN LOGISTICAL CONSTRAINTS

The crucial question is, How are the Soviets able to operate so many divisions with such lean support? The answer is threefold:

1. The Soviets are more cost-conscious than NATO.
2. The Soviets have organized their forces differently from NATO.
3. The Soviets have prepared themselves mainly for the missions of deterrence, political intimidation by massive intervention, and the short war.

Some critics have diagnosed the cost difference between the Pact and NATO as the result of (1) alone. In fact, cost analysis--by focusing on the margin--generally produces relatively small savings; the big savings result from differing assumptions leading to differences in force structure--(2) and (3). In the Pact-NATO comparison, the Soviets are assuming a short war based on shock power as indicated by their strategic needs, military doctrine, and operational practices.³

³This short war thesis in Western Europe is not inconsistent with the Soviets' capability for fighting a somewhat longer defensive war after withdrawing into their own territory. I have not developed this theme because the interesting case, from the NATO viewpoint, is the offensive short war in Western Europe. However, it should be noted that the Soviets' force dispositions are also consistent with a defensive war. Examples are their anti-sea-lane submarine fleet that could cut short a sustained NATO offensive into Eastern Europe, the stationing of their GSFG divisions in what could be characterized as a mobile defense posture, and the air defense orientation of their tactical aircraft. Their emphasis on tanks can be justified by the widely shared military belief that attack is the best defense (even if only a counterattack). Since their own civilians could be mobilized for providing rearward services, their lean logistical system would only require moderate strengthening for a defensive conflict on their own territory. Abstracting from the implications of nuclear parity, the two main arguments against a long defensive war are that the Soviets lack the resources to cope with NATO in a long war and that their client states might not be able to withstand the strain.

Confirming the previously discussed strategic and doctrinal indications of Soviet posturing for a short war are known facts about the Soviets' combat support and their combat service support systems. A characteristic of Soviet forces is their paucity of nondivisional supporting units. For some types of units, such as trucking and medical, the Soviets rely on calling up civil organizations. But other nondivisional units, such as artillery, ordnance, chemical, signal, specialized military maintenance, etc., do not exist except in their active force structure. What little nondivisional support that does exist is disproportionately concentrated in the GSFG and Western USSR. Thus, the Soviet supporting structure would remain necessarily thin. Yet when the structural requirements for a short and long war are distinguished, it becomes apparent that the Soviets can support their divisions for a short war but not for a long war when the nature of the war necessarily changes from Soviet assumptions of rapid movement to a more static war where firepower and sustaining power are more important.

The clearest and most important internal constraint on the Soviets' military capabilities is their maintenance system. It is known that they have a quality-control problem in manufacturing, and that their vehicles in general and their tanks in particular are maintenance-prone.⁴ After a finite number of combat hours, their armored equipment requires major overhaul, which entails such time-consuming chores as pulling the power pack, refitting the gun assembly, etc. In peacetime, the Soviets circumvent their maintenance problems by storing most unit equipment for ordinary training purposes. Storing equipment is so effective in reducing maintenance workloads that even their relatively sparse (by Western standards) maintenance units are not always kept at full strength in peacetime. This is quite important. If few maintenance personnel are needed and trained to fill the peacetime active

⁴ Simple and robust tank design also reduces maintenance requirements. This feature, however, is bought at some cost. With unsophisticated fire-control systems and relatively small tank ammunition storage, the Soviets' tank ammunition requirements are high, their tanks require frequent and time-consuming resupply, and more tanks are required to offset qualitative inferiority. Their tactic of "rushing," however, partially offsets these deficiencies relative to NATO tanks.

force, few will exit annually from active duty into the manpower pool that is expected to flesh out the skeleton divisions and the inactive nondivisional logistical units during mobilization. Therefore, since peacetime demand has been kept "artificially" low by storing equipment, wartime demand from intensive daily use and combat damage will greatly exceed the supply produced from the peacetime maintenance training programs.

How then do the Soviets expect to keep their equipment operating? The answer is in the time phasing of wartime demand. Whereas much of NATO's equipment is in need of maintenance because of continuous training to maintain individual and unit proficiency, Soviet equipment is in storage at its peak of operational readiness. This has a double-edged effect. In the early stages of the war, Soviet equipment can be used without generating serious maintenance requirements.⁵ The price is a "wave" effect: With equipment being simultaneously broken out of storage, much of it will become due for major maintenance simultaneously, swamping Soviet maintenance capabilities. The Soviet intent, of course, is to have much of Western Europe defeated or occupied by this time. In addition, the Soviets have designed procedures to delay the wave effect. Unit replacement of divisions, concentrating maintenance support toward main effort units, and tactics designed to let tanks stay on the roads as much as possible all contribute to flattening the wave and postponing the time when Pact equipment will suffer too high a breakdown rate to conduct further mobile warfare on an extensive scale.

A second internal constraint indicating a short war is imposed by the Soviet truck park. Because Soviet military trucks are a variant of their civil design and others are mobilized civilian trucks, they lack cross-country mobility. Although NATO armies overemphasize it, trucks with cross-country capability are needed for supplying forward units off the roadnet. As long as the war is seen as one of rapid

⁵ United States experience shows that new equipment can be operated extensively for several weeks with only simple maintenance. Thereafter, problems steadily mount, and by six to eight weeks equipment is badly worn. *CONUS Logistics and Combat Service Support*, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, 1 April 1967, pp. 1-5.

movement, in which the retreating forces do not have time to destroy large sections of the roadnet, the lack of cross-country mobility is not a serious constraint,⁶ but it does become so in a long war as destruction mounts. A further problem is that not only are the Soviets' trucks maintenance-prone, but their civil fleet has been plagued with poor maintenance.

Another trucking constraint is a policy of "robbing Peter to pay Paul." The Soviet military depends heavily on the Soviet civil truck fleet for its wartime requirements. Upon mobilization, large numbers of civil trucks would be assigned to Soviet divisional and nondivisional support units. Assigning these already scarce trucks to the military would considerably restrict the industrial production needed to support a long war. Such a war *does* involve high replacement, repair, and ammunition consumption rates--requirements vitiated by the Soviet assumptions of rapid movement and early cessation of fighting. Should these Soviet assumptions not be borne out, the lean Soviet logistical structure will be overburdened, while home production might be inadequate to support another World War II-style conflict, this time against an opponent with superior resources. Over time, of course, as truck production increases, this trucking mobilization constraint would phase out. But it is nevertheless true that the extant Soviet system was designed with this constraint very much in effect; and it thus represents a valid clue as to Soviet war premises.

A third short war indicator is the shortage of Soviet military engineers. The longer the war, the greater is the need for engineering support to maintain and to replace destroyed physical assets, such as the transportation network. The offense also requires greater engineering support of lines of communication than the defense: It is technically easier to demolish than to repair and replace. Another factor is

⁶ Some analysts contend that lack of cross-country mobility will be a serious constraint on the Soviets because of Western air superiority. This argument is based on the "detouring and delay" capabilities of airpower on truck movements. However, for the critical sectors, the Soviets may be able to concentrate sufficient engineer support to minimize detouring. A crucial aspect in this argument, moreover, is the time required to establish air superiority so that sufficient sorties can be released to support ground forces.

that whereas NATO's engineers are generalized and oriented toward LOC maintenance, Soviet engineering is more specialized toward specific combat engineering tasks, many units are poorly suited for LOC maintenance, and LOC maintenance equipment is often obsolete by Western standards. Yet LOC maintenance should be crucial for the Soviets because of their need to use the roads as much as possible in order to reduce maintenance, fuel consumption, vehicle turnaround times, and detouring. This factor suggests that Soviet engineering support is not designed for sustaining a slow-moving offensive against NATO, but is geared for supporting a blitzkrieg-style offensive.